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Massachusetts
Eye and Ear Infirmary
243 Charles Street
Boston, Massachusetts 02114

Cover
At the Massachusetts Eye and Ear Infirmary technology combines with intellectual interaction and human compassion to provide the best possible care for our patients. Laser treatments and delicate microsurgery are two of the ways we seek to save and restore hearing, speech and sight.

It is the people at the Infirmary who make excellent patient care, medical education and research possible.

patients, Dr. Schuknecht originated a new operative procedure, a cochlear endolymphatic shunt, to create a permanent safety valve for drainage of the excess fluid.

"Short term follow-up of patients who have undergone this procedure shows that 90 percent are relieved of disabling vertigo," says Dr. Schuknecht. "We continue to work at perfecting this procedure to not only relieve the incapacitating vertigo of Meniere's disease, but also preserve the hearing of these patients."

Through its tradition of excellence in research, teaching and clinical care, the Massachusetts Eye and Ear Infirmary continues to work at preserving and restoring the gifts of sight, sound and speech for patients throughout the world. But it is, after all, the people at the Infirmary who make these miracles possible. Although we have been able to single out but a few, we salute the dedication and accomplishments of all our staff members. Their continuing search for knowledge propels us toward a future when, hopefully, we will be able to treat and cure the problems we study today.

Delicate microsurgery allows the surgeon to restore the function of tiny inner-ear structures.

Harold F. Schuknecht, M.D., Chief, Otolaryngology

The positive aspects of an academic setting are echoed by Harold Schuknecht, M.D., Chief of Otolaryngology. "Teaching is the best way to have an impact on medical care today," says Dr. Schuknecht. "I've been quite impressed with how much knowledge they have; these young doctors have the most up-to-date information which has to be beneficial to the patients."

Dr. Schuknecht also stresses the advantages of Mass. Eye and Ear as a specialty hospital. "Since every patient has either an eye, ear, nose or throat problem, the Infirmary's services–nursing, diagnostic equipment, laboratories–are all geared towards having the very latest information and equipment in the field," he says.

This specialization also enhances the atmosphere for teaching and learning. "Our educational programs are designed to give in-depth study of our own specialty; we don't dilute, we concentrate," says Dr. Schuknecht. "Every physician who brings patients here is surrounded by colleagues who are interested in the same thing."

Although Dr. Schuknecht takes great pleasure in teaching he is also heavily involved in research and development of new treatments for diseases of the ear. His work has included the development of the Schuknecht stapes prosthesis, an artificial replacement for one of the tiny middle ear bones necessary for hearing.

More recently, Dr. Schuknecht has been perfecting treatment for congenital atresia (absence) of the ear canal. In this condition, the ear canal, ear drum, malleus and incus (middle ear bones which vibrate in response to sound) fail to develop properly. In place of the absent ear canal, there is a solid mass of bone called the atresia plate.

The traditional method of surgical correction for congenital atresia was difficult and resulted in serviceable hearing in only 70 percent of all cases.

But in 1977, Dr. Schuknecht adopted another approach to this condition based on his studies of the anatomical abnormalities in these ears. He now approaches the middle ear directly, by drilling away the atresia plate to create a new ear canal. This new procedure also salvages the malleus and incus, which although malformed, are capable of good sound transmission. Another feature of the new procedure is the repositioning of the auricle (external ear) so that it will align better with the new ear canal.

Dr. Schuknecht has also devised an improved method of skin grafting for the newly created canal and ear drum. The skin grafts, taken from the inner surface of the upper arm, are much thinner than those used previously, allowing the surgeon to overlap the grafts. Because the skin is so thin, the overlapping areas will die off in the healing process. The thicker grafts characteristic of the old procedure for congenital atresia, had to be laid edge to edge.

Results of this new approach show that over 90 percent of Dr. Schuknecht's patients achieve serviceable hearing (30 decibels). Often, patients will be able to hear sounds in the 15 to 20 decibel range, a rare occurrence with the old procedure.

In addition, Dr. Schuknecht, who has been studying ear pathology for over 30 years, has made discoveries about the nature and treatment of Meniere's disease, an inner ear disorder characterized by vertigo, tinnitus (ringing in the ears) and hearing loss.

These symptoms are a result of an increase in the volume of a fluid in the inner ear which results in impaired balance and hearing.

In some patients, the resulting vertigo is so frequent and severe as to cause a real disability. In an attempt to help these

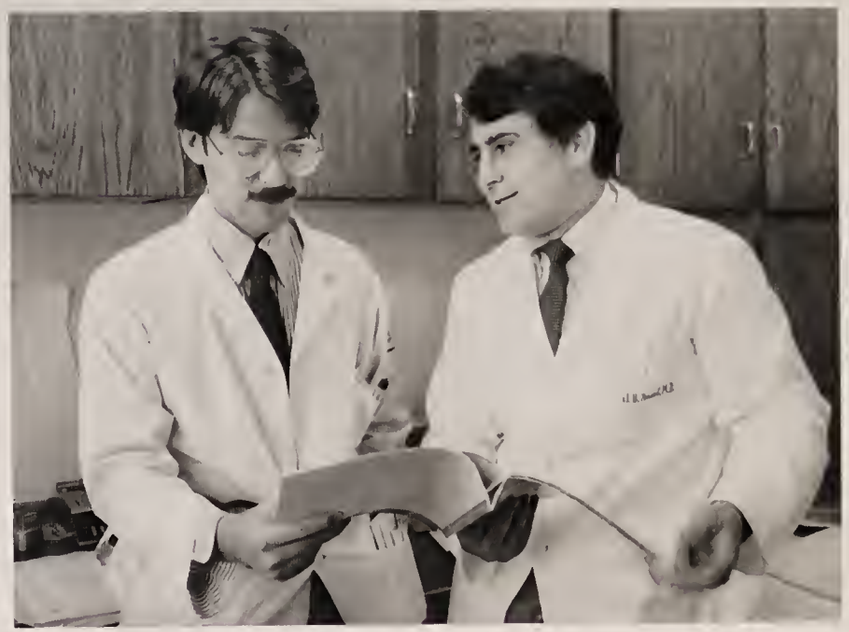
Joseph B. Nadol, M.D., Associate Surgeon in Otolaryngology

Joseph Nadol, M.D., Associate Surgeon in Otolaryngology, is also involved in planning for the cochlear implant team. "This could only exist in an academic setting," he says. "People must have the interest, the time and the interaction between clinical and non-clinical areas for a program like this one to come about. You might say it's an outgrowth of fertile soil," he continues.

Dr. Nadol sees the planned laser center, which will house both eye and ENT (Ear, Nose and Throat) lasers as another opportunity unique to a teaching setting. "The idea is not only to have lasers for clinical use, but to design an area where the laser can be used experimentally in animals," he says. "Obviously, this will benefit the patients seen here because the physicians are likely to be more experienced and have a more rounded knowledge of the technology and limitations of these procedures. In addition, and perhaps more important, we'll have the opportunity to make the system work better for patients."

In addition to searching for better treatments for the future, the Infirmary is addressing other challenges which will face the medical community of tomorrow. "In the future, ENT will see increased subspecialization," according to Dr. Nadol. "The horizons of otolaryngology are expanding with the use of technology and increasing sophistication of surgical procedures. It's becoming more difficult to train residents thoroughly in every aspect of otolaryngology." To meet this challenge, beginning in 1984, the Infirmary's ENT residency will be increased from three to four years, giving young physicians more extensive experience in the otolaryngological specialty.

The Infirmary's commitment to physician training does more than serve the future by educating tomorrow's doctors. "Having a teaching program improves the quality of patient care," says Dr. Nadol. "In many ways the care at a teaching institution has the capacity to be better than average–and usually is." Dr. Nadol cites several reasons for this conclusion:



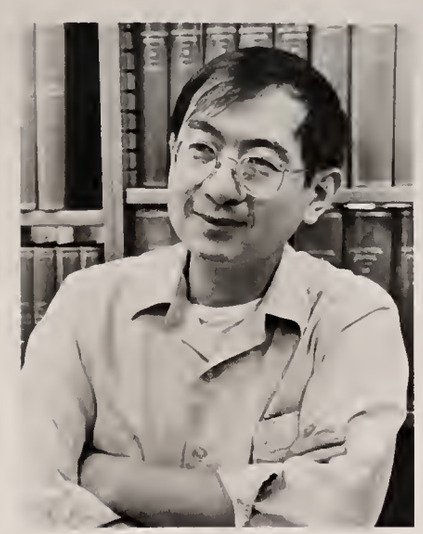
A residency program stimulates discussion and information exchange, an important component of quality patient care.

☐ Residents are available 24 hours a day, seven days a week, whereas no one doctor can be available all the time.

☐ The medical staff in a teaching institution functions at a better level intellectually because one of the first callings of the medical profession is still teaching.

In this setting staff physicians become acutely aware of their positions as role models. "It tends to make them sharper because they know they are being looked to as examples," Dr. Nadol says. "They are asked questions by bright young people–so there is a give-and-take relationship. This exchange of experience and knowledge improves the quality of patient care."

More than twenty-five years of research into the mechanisms of hearing have led to the development of the diagnostic tool, Auditory Evoked Response, and a hope of hearing for the profoundly deaf through cochlear implants. The Infirmary will begin a cochlear implant program in the near future.



Nelson Y.S. Kiang, Ph.D., Director, Eaton Peabody Laboratory of Auditory Physiology.

For more than 150 years staff members at the Massachusetts Eye and Ear Infirmary have dedicated themselves to the preservation of the senses.

In the Department of Otolaryngology, researchers and clinicians tackle disorders of hearing and speech seeking to restore and preserve these precious gifts.

In the Eaton Peabody Laboratory of Auditory Physiology, Dr. Nelson Kiang and colleagues have been working for more than 25 years to unlock the mysteries of hearing. Dr. Kiang came to the Infirmary to begin this unique laboratory which seeks to combine the disciplines of basic science and medicine. "We framed a research program to study how the auditory system works so that clinical problems for which there were no solutions could be approached," says Dr. Kiang.

As a focal point for researchers from varied disciplines, the lab incorporates methods and concepts from the many fields related to the complex process of hearing. Electrical engineers, computer scientists, acousticians, psychologists, physiologists, anatomists, neurochemists, neurologists and otolaryngologists work together in this setting to describe the mechanisms of hearing.

These interactions have not only produced insights into the basis of the auditory process but are resulting in clinical advances as well. Previous Eaton Peabody research (using signal-detection techniques to measure electrical responses of the ear and brain) is the basis for clinical procedures now in use at the Infirmary. The Auditory Evoked Response Lab, under the direction of Dr. Aaron Thornton, evaluates auditory responses in individuals who cannot be tested by traditional auditory testing procedures which require cooperation from the patient. This clinical laboratory utilizes techniques and knowledge originated in the Eaton Peabody Lab.

Another laboratory interest that is beginning to work its way into the clinical arena may some day help to solve the problem of profound deafness. Conductive hearing disorders (involving faulty transmission of sound) have long been treated through surgery or the use of hearing aids. But patients afflicted with a sensorineural hearing loss (involving defects in the inner ear or brain) can be helped only minimally, if at all, by hearing aids.

For a quarter of a century scientists at the Eaton Peabody Laboratory have been studying the coding of acoustic information (sound) in the auditory nerve and brain. This research, which has produced some insights into how we analyze sounds, may one day help doctors to treat sensorineural deafness. Utilizing this coding information it is hoped that this problem can be approached through bypassing the inner ear and electrically stimulating the auditory nerve directly.

It is now possible to surgically insert a device called a cochlear implant, to accomplish electrical stimulation of the auditory nerve. But more research is needed to determine the exact kind of stimulation the brain needs to obtain not just the sensation of hearing but the capabilities of communication. The task now faced by researchers is to encode the electrical signals in such a way that the brain receives useful cues about the sound characteristics in order to decipher the signals.

In the near future Eaton Peabody scientists will attempt to take their studies of stimulus coding one step further–into the clinical setting. Infirmary physicians will begin performing cochlear implants and researchers will work at perfecting the coding systems in hopes of providing better speech recognition to the profoundly deaf.

David Epstein, M.D. Director, Glaucoma Service

The search for solutions to potentially blinding eye disease is a long-standing Infirmary mission. As director of the Glaucoma Service, David Epstein, M.D., Assistant Surgeon in Ophthalmology, coordinates patient care and research efforts aimed at finding better treatments for a disease which is the second leading cause of blindness in the U.S. "I'm really trying to continue the traditions established by Drs. W. Morton Grant and Paul Chandler, founders of the Glaucoma Service," says Dr. Epstein. It was under the leadership of Dr. Grant, former director of the service, that the Infirmary became known as a leader in glaucoma treatment and research.

As one of only a few centers in the country studying glaucoma, the Infirmary is looking for answers to a problem found in two percent of the adult population. Infirmary researchers and physicians are involved in clinical and laboratory research on two fronts. "The most recent advance in glaucoma treatment is the use of lasers," says Dr. Epstein.

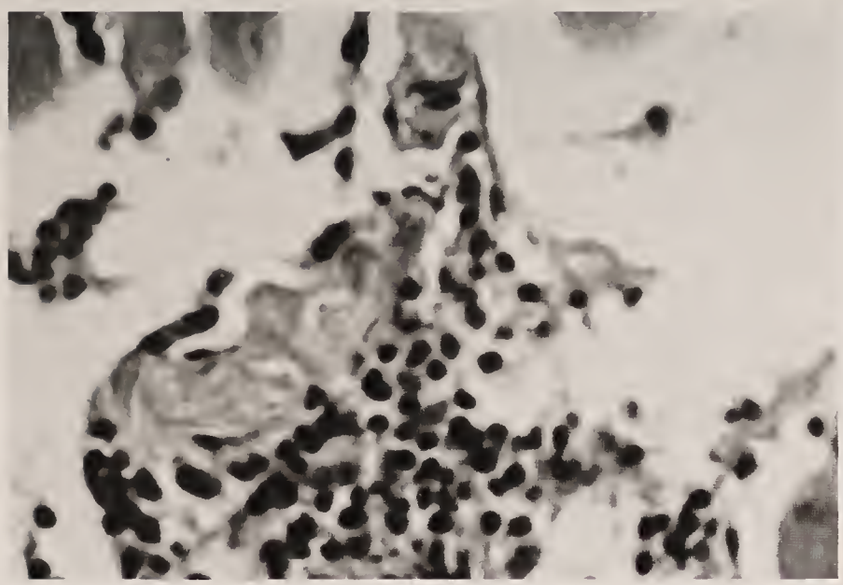
In both laboratory and clinic, Dr. Epstein and coinvestigators Carmen Puliafito, M.D. and Roger Steinert, M.D. are exploring the uses of argon and YAG lasers in alleviating the problems of glaucoma. In the near future the Infirmary will establish a laser center in which our new YAG lasers will be used along with the argon laser for treating patients with glaucoma. The Infirmary has also been chosen as one of the seven centers participating in a National Eye Institute sponsored clinical trial which will examine the efficacy of laser treatment in the early stages of glaucoma.

But laser treatments are only one method of attacking this disease. "Open angle glaucoma, the most common kind, is still a medically treated disease," says Dr. Epstein. "It is only when treatment with drugs fails that we must resort to surgery, or more recently, lasers, to alleviate this problem. So we are also involved in the study of new medications to use in glaucoma in hopes of finding more effective treatments for the future." In the laboratory, Dr. Epstein and his colleagues work to understand the causes of glaucoma and to develop more specific treatments. "My goal is to find a cure for glaucoma. And I firmly believe that glaucoma is a curable disease in my lifetime."

At the Infirmary, argon and YAG lasers are used in both treatment and research of eye problems like glaucoma and retinal diseases. Our researchers continue to seek new ways to utilize this versatile medical tool.

Another, equally important component of the Glaucoma Service is patient care. The Glaucoma Clinic, which has more than 8,000 patient visits each year, is one of the most successful units in the hospital. Dr. Epstein attributes the clinic's success to the combined efforts of full-time and part-time staff, residents, nurses and paramedical personnel. "It's a melting pot," he says.

But the Glaucoma Clinic is important, not only for patient care but as an educational setting and for clinical application of research. "The community care of glaucoma in New England is outstanding," Dr. Epstein says. "And the Infirmary should be proud of its contribution to this high level of care. The role of the teaching hospital in glaucoma is to develop new knowledge for the future so that we not only stay current, but stay as we are now–on top of the field."



In the Immunology/Uveitis Clinic systemic autoimmune diseases are often diagnosed in patients presenting with eye problems. The slide pictured above shows inflammation in a blood vessel of such a patient who was successfully treated for both the eye problem and life threatening systemic disease.

Drawing upon his understanding of the immune system, Dr. Foster has developed a thorough, dedicated and extremely extensive diagnostic protocol for patients presenting with these immunological eye diseases. "So often these patients don't have a clear-cut diagnosis when they come to us–they have an eye problem," Dr. Foster says. "With careful searching we often discover that they have a problem somewhere else, too. Then, through what frequently turns out to be an excruciatingly lengthy piece of detective work, we very often can pin down the specific diagnosis and begin treatment."

By using systemic immunosuppressive drugs the Immunology/Uveitis Clinic has in many cases been able to halt previously hopeless blinding diseases. "Our experience has been highly gratifying–one could even say spectacular for some of these diseases," says Dr. Foster. "But this is not an end in itself. We continue to work to try to pin down the cellular and molecular details of what is happening in the immune systems of these patients and in so doing, find a more specific therapeutic approach to correct the abnormality."

The Mass. Eye and Ear Immunology/Uveitis Clinic, one of only two such clinics in the United States, treats patients with blinding conditions related to the immune system.

C. Stephen Foster, M.D., Director, Immunology/Uveitis Clinic

This interaction between laboratory and clinician is not limited to the pathology department but exists throughout the Infirmary. It is this interchange among physicians and research scientists which attracts people dedicated to finding answers to the mysteries of disease.

"The best possible kind of attack on understanding and eliminating disease is unquestionably a happy marriage between laboratory and clinical research." With these words, C. Stephen Foster, M.D., Mass. Eye and Ear Assistant in Ophthalmology, begins to describe his work. Dr. Foster is the director of a recently established Immunology/Uveitis Unit, one of only two clinics in the U.S. that treats eye diseases associated with disorders of the immune system.

Immunology, which involves understanding the body's ability to repel the onslaught of foreign substances, also includes the study of diseases that originate when the system goes awry and the body turns against itself. These conditions (termed autoimmune diseases) may strike the structures of the eye anywhere from the external eyelid to the internal retina and optic nerve. Uveitis, an inflammation of the main vascular coat of the eye, is one such disease. There are also certain eye diseases which affect body-wide systems, such as rheumatoid arthritis and lupus erythematosis. Dr. Foster attacks these problems with a double-edged sword. "Our commitment in the immunology laboratory is to try to get at the very important but extremely basic issues of the eye diseases that have some relationship to the immune system. Hand in glove with the laboratory is the clinic, treating patients with specific problems," says Dr. Foster. "In the clinic, patients are not simply seen and treatments tried; but with the patient's approval, a very systematic study is performed, and a well-thought-out evaluation of different drug programs is accomplished."

Dr. Foster is uniquely suited to his investigations of these diseases, with training in immunology and internal medicine in addition to ophthalmology. His laboratory investigations have led to an understanding of the reactions which occur when a foreign material (such as a corneal transplant) is placed in the eye. In fact, his studies have disproved the previously accepted concept of "immunological privilege" which held that foreign material in the eye was "invisible" to the patient's immune system. Dr. Foster's results show the opposite to be true.

"Introduction of foreign material into the eye is associated with almost instantaneous recognition by the patient's immune system," he says. "But something very special happens when this foreign material is put into the eye–the body responds with an elaboration of lots of suppressor-T cells." (Suppressor-T cells are a part of the immune system; they are responsible for regulating the degree of "attack"-type immune response.) Tolerance to foreign substances like corneal transplants is a result of active suppression of the immune rejection reaction by the body. This has enormous implications, not only for transplants, but also for herpes simplex infections, for uveitis and for autoimmune diseases like lupus and rheumatoid arthritis according to Dr. Foster.

The Immunology/Uveitis Clinic was an outgrowth of Dr. Foster's expertise and research in the field of immunology. Knowing of his background in this area, other physicians began referring patients with immunologically-based eye diseases. Although these patients were originally seen by Dr. Foster in the Cornea Service, the increasing demand to treat these eye problems–many of which did not involve the cornea at all–pointed out the need for a specialized clinic. In response, the Immunology/Uveitis Clinic was opened in July of 1981 as part of the Retina Service.

In continuing education the teacher's role changes again. By offering seminars and courses to physicians, Infirmary staff members like Dr. Albert try to sort out what is most important in the tremendous amount of new knowledge which is available and put it into perspective for the practitioner.

These learning experiences, which benefit both student and teacher, are an integral part of the structure of a teaching hospital like the Mass. Eye and Ear Infirmary. But they are only one aspect of the ongoing exchange of information which ultimately results in high quality patient care.

As a clinical pathologist, Dr. Albert is a primary example of how the academic setting provides fertile ground for understanding disease and implementing successful treatment.

Dr. Albert describes ophthalmology as a specialty allowing visual diagnosis, but it is the capability of the pathologist to enhance this visualization. "We enable physicians to see the cellular structure of the eye problems that they are seeing in their office, and this gives them greater perspective and insight into the diseases that they are treating. From a basic standpoint, pathology is one of the prerequisites for practicing good medicine–you have to know about the structure and anatomical changes which occur in disease in order to be a good practitioner."

Dr. Albert and the staff of the Eye Pathology Laboratory serve the clinical pathology needs not only of the Infirmary, but other hospitals in the region as well. Because eye pathology is so specialized, one of the Infirmary's functions is to act as a referral center not only for sister hospitals within the Harvard system but also for other institutions throughout New England.

But the Eye Pathology Lab at Mass. Eye and Ear embodies more than a clinical service to the community. "The interaction with research scientists, the degree of stimulation, the stress on quality and innovation that you might not find elsewhere, creates an atmosphere in which you have creativity and progress," says Dr. Albert.

The Mass. Eye and Ear Pathology Laboratory acts as a referral center for all of New England.

Residents learn to decipher the microscopic message found on a pathology slide under the guidance of a skilled instructor.

Research, Teaching and Clinical Specialization:
A Formula for Medical Excellence

In a city famed as a medical mecca, the Massachusetts Eye and Ear Infirmary continues to strive toward providing unequaled medical care in its specialties of ophthalmology, otolaryngology, and reconstructive surgery of the head and neck. The Infirmary's history as a world renowned medical institution is only the beginning of the story. While this tradition is the foundation for the quality patient care, education and research found at today's Infirmary, it is the ongoing dedication of our staff in these areas which continues to insure this institution's position as a leader in clinical medicine, physician training and investigative research.

It is, in fact, the combination of these interests under one roof which provides the atmosphere and stimulus for excellence in medicine. When exploring the Infirmary's work it is impossible to separate one area from the others; they exist in tandem, each enhancing the others, to produce the intellectual stimulation, patient care experience and learning processes which over the course of time lead to answers for previously unanswerable questions.

In exploring the activities of various Infirmary people you will see a constant overlap of teaching, research and clinical care because in the spectrum of medical advancement the three are inseparable. It is this marriage which enables the Infirmary to continue to add chapters to its already established story of quality medical care.

Daniel M. Albert, M.D., Director, David G. Cogan Eye Pathology Laboratory

Department of Ophthalmology:
Clearing the Way for Visual Progress

As a clinical pathologist, Professor of Ophthalmic Pathology, and the director of the David G. Cogan Eye Pathology Laboratory at the Massachusetts Eye and Ear Infirmary, Daniel Albert, M.D. has direct involvement in teaching, research and clinical care. He describes his teaching activities as being on three levels: student education at Harvard Medical School; pathology training for Mass. Eye and Ear residents and fellows; and continuing medical education for physicians both at the Infirmary and in the community.

Dr. Albert's teaching role at each of these levels serves a different but complementary purpose–all enhancing the quality of clinical care. "The vast majority of medical students we teach will not go into ophthalmology," Dr. Albert says. "But still, to a large extent, general eye care is provided not by the ophthalmologist, but by the surgeon, the internist or the pediatrician and it's very important that these people have a knowledge of the eye and diseases which cause blindness. Therefore, we try to stimulate them to go on and learn more about the eye and to be knowledgeable regarding eye diseases."

"With regard to residents, we want them to be the highest quality practitioners they can be," Dr. Albert continues. "In being a good clinician you must have a good understanding of the pathology of eye disease."

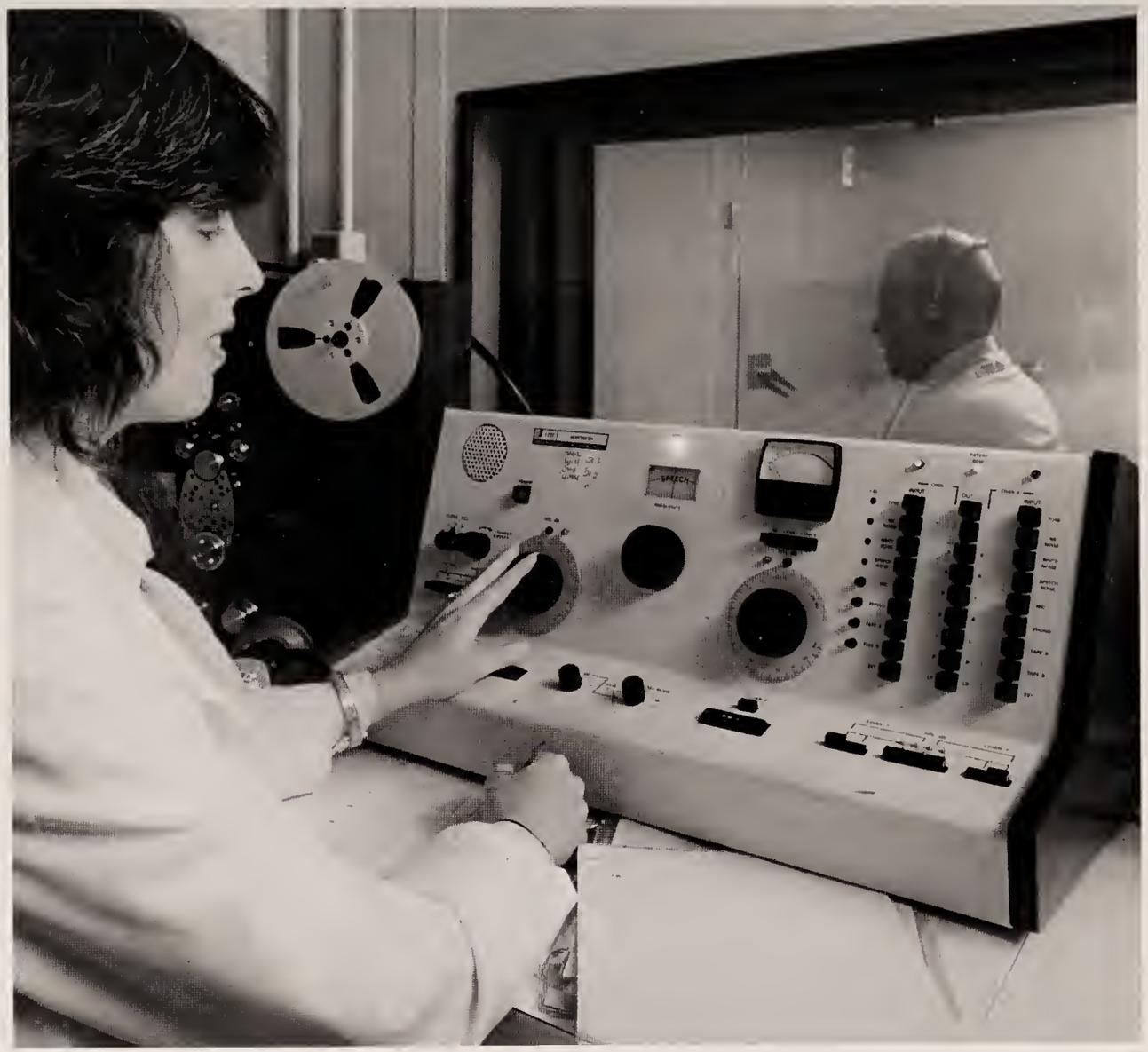
When working with fellows the teaching process becomes somewhat more creative. "Pathology is in a privileged position in that it straddles the lines between the basic sciences of the biochemist and geneticist and the world of the clinician and the patient," according to Dr. Albert. "In working in eye pathology you understand the problems of the clinician but also are exposed to the information and techniques of basic science. You must try to act as a liaison to inform basic scientists of problems that exist on the clinical side and get the two to interact."

The Electron Microscopy Laboratory under the direction of Doctor Robert Kimura is undergoing renovation with the installation of a new transmission electron microscope and a new scanning electron microscope. Dr. Kimura is continuing his studies on endolymphatic hydrops and the innervation of the inner ear.

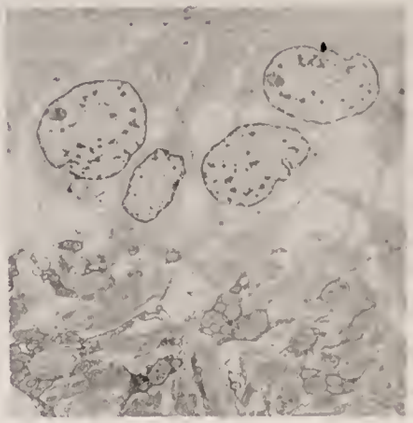
Concluding Remarks

Many of us attended the formal events commemorating Harvard Medical School's bicentennial year. The Department of Otolaryngology has now been affiliated with the Harvard Medical School for 50 years. The academic leadership and intellectual environment provided by Harvard is a great stimulus for the professional staff of the Infirmary.

Quite clearly, the high quality of our clinical services, teaching and research would not be possible without the Harvard Medical School, the trustees of the Infirmary, and the many dedicated benefactors of the Infirmary. Working together, we shall make this world a better place in which to live.



Infirmary audiologists performed over 11,000 hearing assessments during 1982.



Electronmicroscopic studies of human inner ear changes help researchers investigate the causes of hearing loss.

Harold F. Schuknecht, M.D.,
Chief, Otolaryngology

The year 1982 has been very productive for the Department of Otolaryngology. As the publication list shows, we have produced new knowledge on a variety of subjects, both basic and clinical.

Clinical Services

The department consists of 5 full-time and 58 part-time otolaryngologists. This staff in conjunction with 17 house officers provided care for 4,355 inpatients, 88 percent of whom had surgical procedures. Additionally, the staff attended 51,633 ambulatory patients of whom 31,560 were cared for in the outpatient clinic, 13,523 in the emergency ward and 6,550 in the offices of the full-time staff. Ambulatory surgery cases numbered 2,362.

Very important to this operation are the clinical services provided by audiology, evoked response audiometry, electronystagmography, bacteriology, and the clinical laboratory, as well as the nursing and administrative staff. It is a pleasure to see how harmoniously and effectively this health care team works to serve our patients. Rhoda Morrison and her team of 11 audiologists performed 11,030 hearing assessments during the past year. Doctors Aaron Thornton and Barbara Sprague have assessed the hearing status of 852 patients by the use of brain stem evoked response audiometry, and they have also instituted facial nerve testing as a clinical service. Electronystagmography was performed on 543 patients.

A special note of thanks is due our house officers. Their concern for the clinic patients as well as the care they provide for the private patients contributes importantly to the quality of clinical services.

Doctor Shanrong Shi from Sichuan, China is spending two years as a Research Fellow with Doctors Max Goodman and Ben Pilch in the ENT Pathology Department, after which time he will return to China to practice what he has learned. Our pathologists are enjoying remodeled, expanded office space.

Teaching Program

During the past year, the Department of Otolaryngology has given two courses under the sponsorship of the Department of Continuing Education at Harvard Medical School. A course on Clinical Otology was held in June in the Auditorium of the Shriners Burns Institute which attracted 125 registrants in addition to our own staff. The emphasis of this course was the diagnosis and treatment of ear disease. The course included clinical-pathological conferences, videotapes and movies of operative procedures, and panel discussions. Among the faculty were eight outstanding otologists from the United States and foreign countries. In May a course was given on general otolaryngology principally for family physicians, pediatricians and internists. Doctors William Wilson and Joseph Nadol, as a result of their experiences in giving several of these courses, have written a book entitled *Quick Reference to Ear, Nose and Throat Disorders*. In June, the HFS Society met for a two-day scientific meeting in the Meltzer Auditorium. That group consists of former research fellows of the Department and numbers 76 members from 27 countries.

The newly structured course on basic sciences and clinical otolaryngology which is given to house officers appears to be effective; all six of our recently graduated residents passed the specialty board examinations above the 70th percentile. Doctor Joseph Nadol has been appointed Director of Residency Training replacing Doctor William Montgomery. The teaching program for Harvard Medical students is being revamped to handle a larger number of students as otolaryngology becomes a required course for them. A 50-minute videotape on the symptoms, diagnosis, pathology and treatment of Meniere's disease has been made. This tape is being offered for sale and rental throughout the nation and abroad.

Research

One of the interests of the research staff is human ear pathology. The human temporal bone collection now numbers 1,212. Research fellows who worked in this laboratory during the past year were Doctor Yin-Zao Gao, Xian, China; Doctor Thomas Eby, Milwaukee, Wisconsin (now a resident); Doctor Peter Walby, Belfast, Northern Ireland; Doctor Hideichi Shinkawa, Sendai, Japan; and Doctor Iwao Ohtani, Fukoshima, Japan.

The staff of the Eaton Peabody Laboratory of Auditory Physiology under the direction of Doctor Nelson Kiang continues to sort out the neurophysiological mechanisms of hearing. A recent important discovery by this group is the anatomical relationship of the type II cochlear neurons with the outer hair cells of the organ of Corti. This finding was published in *Science* in August of 1982. Doctor Michael Joseph, working as a special fellow on a Career Investigator Award, and Doctor Eric Teig of Oslo, Norway, have joined Doctor Robert Levine in the study of reflex mechanisms in the auditory system. Doctor Edmund Mroz, formerly of the Department of Biochemistry, Harvard Medical School and Doctor William Sewell have reactivated the Biochemistry Laboratory and are working on the neurotransmitter mechanisms of the auditory and vestibular systems.

The level of training and skill of our staff members is higher than ever. There is also an unusual degree of subspecialization. Approximately 45 physicians restrict their practices to a subspecialty of ophthalmology, and a number of these have well-deserved worldwide reputations, drawing a substantial proportion of their patients from great distances.

Teaching

The Teaching Committee, consisting of nine experienced educators, continues to constantly monitor and upgrade the teaching activities in ophthalmology. Among the more urgent planning tasks is the preparation for changes in medical student teaching. Ophthalmology, presently an optional subject at Harvard Medical School, will soon become an obligatory two week course requiring expanded teaching staff.

The residency continues to attract better applicants than ever. As a result of perpetual efforts to improve the training program, the second year residents now have a larger block of time assigned for operating room duties. Also, a new six-week rotation on the island of St. Lucia in the Caribbean has been established. Under the supervision of Dr. Bradford Shingleton, it provides the residents with exposure to different forms of eye disease as well as a larger surgical experience. The present Director of Residency Training is Dr. Frank Berson and the Assistant Director for Residency Training is Dr. Donald D'Amico.

The Infirmary endures as the country's most important center for fellowship training. In the last eight years the number of fellows has increased from 24 to 58 at any one time. Some fellows are straight research fellows, some are all clinical, but most combine both types of activities.

Our two basic science courses in ophthalmology, held in Maine and in Boston, maintain their high level of teaching. In addition, numerous shorter courses and teaching sessions are held during the year and many outside guest speakers visit our program. This year's Dunphy speaker was J. Donald M. Gass, M.D. of Miami; the Chandler Lecturer was Stephen Ryan, Jr., M.D., of Los Angeles.

Research

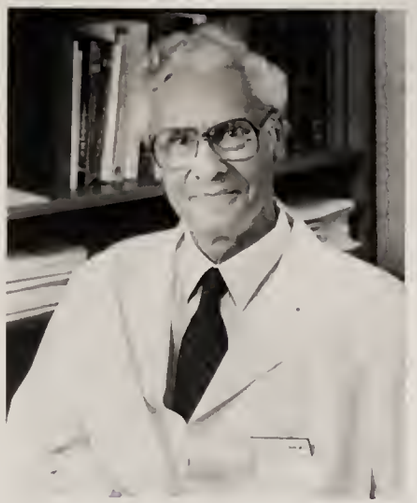
We are presently in the process of extending the research laboratory facilities somewhat, but space still poses a problem for future expansion. An animal room has just been finished and other constructions are underway. In spite of cramped facilities, however, laboratory research is impressive.

Patient care continues to be a top priority in the Ophthalmology Department.

Eye research expenditures at Mass. Eye and Ear (direct plus indirect costs) went from a little over half a million dollars in 1974 to nearly four million at present, a 700 percent increase. In spite of a harsh national fiscal climate for research, our investigators have so far done very well financially. In addition, substantial endowments for research are presently being built up at the Infirmary. The number of publications has also more than doubled in the last eight years.

In May 1982, Eliot Berson, M.D. was appointed the William F. Chatlos Professor of Ophthalmology, to continue as Director of the Berman-Gund Laboratory for the Study of Retinal Degenerations, a position he has held since 1974.

Finally, with overwhelming commitment to both clinical and academic excellence, the Department continues its tradition of leadership and outstanding achievement.



Claes H. Dohlman, M.D., Chief, Ophthalmology

The year 1982 has been one of progress in every area of ophthalmology at the Infirmary. The following are some of the highlights:

Clinical Care

Patient care continues to be the top priority in the Eye Department and we believe that the level of care provided on a daily basis is excellent. In the various committees throughout the system we constantly monitor these high standards as well as explore means to further improve care when technology or research has disclosed new possibilities.

The number of inpatients and surgical procedures continues to increase. In total surgical volume, the Eye Service at the Infirmary is the largest in the country. The outpatient clinic volume is holding at the level of the previous year except for some decline in the emergency room. Private outpatient visits continue to grow.

A new Glaucoma Service of 3,500 square feet was recently completed. Under the leadership of Dr. David Epstein, this well-equipped and well-staffed clinic will allow better care for more glaucoma patients in the future. In addition, the Retina Service has been physically expanded, enabling Drs. Regan, Gragoudas, Seddon and D'Amico to more fully direct their clinical and teaching activities.

A new pathology laboratory, the David G. Cogan Eye Pathology Laboratory, has recently been finished. Drs. Albert, Dryja, Sang and Epstein are working to make this the country's most prominent center for eye pathology and related research.

In addition, the General Eye Service has been remodeled. The high level of patient care continues and plans for organizational improvements are presently being addressed.

Staff

The Infirmary's Active, Associate and Assistant Staffs number 125 ophthalmologists. In addition, about ten members of the Consulting and Honorary Staffs are still actively practicing. A large portion of our staff is young and has been admitted only recently. The net addition of 54 members to the staff in the last eight years strained hospital resources, resulting in many more applicants seeking staff privileges than could possibly be accommodated. To solve this problem, a moratorium on further admission was instituted a year ago by the Board of Managers and stricter criteria for admission were adopted. Subsequently, the moratorium was lifted and six able applicants were admitted recently to the staff.

The Octopus Computerized Visual Field Tester uses the latest technology to assess eye damage caused by glaucoma and other diseases.

While building construction has proceeded, and scenes like the installation of the chiller are enacted throughout the Infirmary, our most important missions–teaching, research and patient care–are carried on without interruption. While riggers were lowering ten tons of equipment onto the roof of the Infirmary, only one floor below nurses were caring for patients whose needs have required our nursing staff to develop technical skills unheard of ten years ago.

As our range of services has expanded to include more chemotherapy patients, as new surgical procedures have been developed and implemented, as more technological innovations are introduced, our nursing staff has developed technical, teaching and interpersonal skills to meet the complex demands of the care we provide.

As an example, one of our 12th floor nurses was called upon to teach a patient's daughter to care for her father. The patient was a middle-aged man with cancer which had invaded the sinuses and was inoperable. He was verbally incoherent, was prone to nosebleeds and had periods of rage when he would throw things out of frustration. He needed intensive mouth care, skin care and tube feeding. The patient wanted to go home and his family was in agreement, although they were unsure that they could manage his care. The patient's acceptance into a hospice program hinged on his daughter's ability and commitment to care for her father.

Training this young woman was not an easy task. At first, the daughter would observe for a while then run out or cry. But still she insisted that she wanted to care for her father. The nurse did not give up; she sat with the young woman, reassured her, dispelled her fears (the daughter thought that cancer was contagious). She then identified the daughter's knowledge and skill deficits and adapted to the frightened daughter's needs. Care that at first seemed overwhelming was broken down into segments; initially the nurse would perform a task, and eventually, the daughter was able to repeat the demonstration. Our nurse made teaching tools for the daughter, and helped adapt treatment schedules to meet the young woman's needs. After four days, the daughter was in complete control of her father's needs, and she was both grateful and excited. She knew when and how to get help, and was reassured to know that community services would also be involved in her father's care.

Similar stories occur every day at the Infirmary. A year's work is the sum of the daily efforts of all our staff. An annual report is a report of what we as a team and a family have done.

Each of these operations and those in all 30 Infirmary departments are governed by our budgeting and management systems. Our hospital fiscal systems are regulated by both the state and federal governments. At the end of 1982, Massachusetts hospitals were given a new cost-containment law–Chapter 372–which redefines the reimbursement system and ultimately determines our overall budget.

Educating patients about post-operative self care is an important role of nurses at the Infirmary.

But Chapter 372 was not the beginning of cost containment for the Infirmary; as an institution we have a long history of effective fiscal management. In fact, while the new legislation was being molded, the Infirmary proceeded with its budget-building process which began in late April. During this period, cost-saving measures were being devised by management and medical staff. Drafting budgets which anticipated changes in the reimbursement system and new formulas for setting rates, as well as factoring reductions in patient volume and changing inflation rates, took the joint effort of the management group, medical staff and all Infirmary department heads.

Our existing productivity-based management systems have given us the tools to better respond to the changing reimbursement structure than many other institutions. Reductions have been achieved by identifying costs through our acuity systems and developing more prudent management of our resources.

The complexities and the layers of human interaction required to deliver the best possible health care in today's society cannot be overdrawn. The return in the improvement of the quality of life for our patients cannot be overestimated. The talents of the people who work at the Infirmary are diverse and rich. What they give to their jobs enables all of us to pass through the doors that bring us the ultimate success–the restoration of sight, hearing, and speech to the patients we serve.

Charles T. Wood, General Director

Louis Pasteur once said, "These three things–work, will and success–fill human existence. Will opens the door to success. Work passes these doors, and at the end of the journey, success comes in to crown one's efforts."

I'd like to talk about a few of the doors we've passed this year. To review a year at the Infirmary is to review the work of 1100 employees, 305 medical staff and 232 volunteers. The statistics are impressive: 18,203 surgical procedures, 123,189 visits to outpatient clinics, 14 percent reduction in energy consumption, 72 research grants and a total budget of $39,400,000.

The stories behind these statistics are even more interesting. A few vignettes of projects that have occurred within the past year will give you an idea of the complexities of the Infirmary and the character of the people who work here.

"Valor under Construction" is an award that could be made to almost everyone working at the Infirmary. As the building program continues, so do all of our services–and more. Working under less-than-optimal circumstances has often been, for many people, the rule rather than the exception. But delivery of care has never been abrogated in the process.

One Tuesday in July 1982, the Outpatient Pharmacy shut the metal roll-down window at its converted-nursing-station location on the second floor of the Charles Street Wing. Promptly at 8:00 the next morning it opened for business in new quarters in the Main Lobby. Transitional prestocking of 5,000 pharmaceutical items and other preliminary preparations of the area had taken place the week before; major equipment was moved overnight. Installation and preparation were completed within five hours, using five pharmacy staff members and six workers from Building Services. Seemingly overnight, the Outpatient Pharmacy was transformed from a makeshift, crowded operation which serves over 100,000 outpatients a year, into a modern, efficient, convenient facility which will benefit the Infirmary's ambulatory services in a prime location.

During the night and over the weekend, without cessation of services, moving from old or temporary quarters to newly built space is a scenario repeated frequently at the Infirmary. In the past year, Building Services has devoted 1,700 hours to construction related moves.

Another move which took place in July started at 6:00 on a Friday night, when six flatbed trucks and a 142-ton crane rolled up in front of the Infirmary. On Saturday Charles Street was blocked off and the crane was rigged to lift a 20,000-pound electric centrifugal chiller onto the roof of the Infirmary. Laboring in 100-degree-plus heat, riggers hoisted the chiller, in two pieces, 250 feet from the street, clearing the parapet wall of the Infirmary by only inches, and lowered it 40 feet to the roof below.

The new Outpatient Pharmacy provides convenient in-hospital service for over 100,000 patients each year.

The installation of the chiller was the culmination of an effort which had begun 15 months before when the Infirmary commissioned a technical audit to determine where we could best invest our funds for energy savings. With the shortest investment payback period (1.7 years) the installation of the chiller was the project of choice. We then submitted an application to the Federal Department of Energy and the State Office of Energy Resources for a grant of $100,000 towards the $210,000 cost of buying and installing the chiller. Concurrently, we submitted an application for Determination of Need with the State Health Department.

After shepherding both of the applications through the bureaucratic process, we were awarded the grant and a Certificate of Need. Negotiations then began for purchase of the equipment and installation.

Planning for installation included the factoring-in of wind, traffic, time and manpower. Like so many other Infirmary projects, this operation was a matter of skill, timing, precision, and careful consideration of the optimum method and outcome. And like many other operations here, those factors contributed to our ultimate success.

In keeping with our emphasis on planning for the future, we have commissioned a feasibility study by Health Systems, Inc. on the uses of the Charles Street Garage and the recently acquired Edison Building at 325 Cambridge Street. As we look ahead to effective utilization of these properties, we will also be searching for the most efficient use of other resources. With the constraints posed by the Massachusetts health care cost-containment bill–Chapter 372–Infirmary administrators will be looking for methods of reducing costs without cutting services or programs.

With the changing reimbursement system under Chapter 372 and current health care market trends, the need for us to bolster our ambulatory care area is most pressing. The Ad Hoc Committee on Reorganization of Ambulatory Services, chaired by Robert Williams, has served a vital function in evaluating our current ambulatory system and outlining possible models for reorganization. The committee's recommendations are currently under study by the Officers of the Corporation, who will make suggestions regarding these services in the near future.

The Ad Hoc Committee on Manpower and Medical Staff Appointment Criteria, chaired by James Summers, has completed the first phase of its work by establishing a quantifiable framework serving as a guideline for considering new medical staff appointments. The Manpower Committee is now working on the second phase of its charge by developing promotion criteria along with a system for reappointment of the medical staff.

In 1982 the Executive Committee began addressing several issues involving our training programs. To assist in resolving these questions the Task Force to Review the Department of Ophthalmology Training Program was appointed.

The Executive Committee also accepted a recommendation from the medical staff for a pilot program using the Caribbean Island of St. Lucia as a training site and surgical rotation for residents. This program which allows more surgical exposure for our residents, has been approved by the Accreditation Council of the American Medical Association and has been sanctioned by the Board of Managers for a trial period of one year.

The past year has been a time of perseverance, commitment and hard work for both the Board of Managers and the Executive Committee. We have addressed issues, weighed options and sought solutions. We have tried to plot a smooth and successful course for 1983 and beyond. But in this sea of sometimes unpredictable and frequently changeable circumstances, we must continue to strive to meet the challenges of the future. Funding the completion of the building program will challenge us. Coping with Chapter 372 will test the strength of our management and cost-containment systems. We believe that our corporate reorganization will make us more able to respond adequately to the needs of tomorrow. Our mission remains the same–optimum patient care, teaching and research in ophthalmology and otolaryngology.

Along with surgical advances and technological achievements, human contact plays an important role in patient care at the Infirmary. For twelve-year-old Valerie Smith, this contact helped ease uncertainties surrounding the larynx reconstruction which would make her first words a reality.

Melville Chapin, Board Chairman

August R. Meyer, Board President

Providing for the future of the Massachusetts Eye and Ear Infirmary and the continuation of its high standards for patient care, research and training has been of primary concern for both the Board of Managers and Executive Committee of the Corporation during the past year.

The most visible evidence of our work is in the final phase of the building program. During 1982, we have seen the completion of the pharmacies, personnel offices, audiology expansion, Eye Pathology Department and the General Eye Service. New facilities for the Retina Service, Glaucoma Service and Eye Social Service are now in use. With construction in other areas still to be completed, the Building Fund Steering Committee had a busy year. To keep pace with the cost of these facilities, and allow for additions to the construction package, including the Day Surgery Suite, the campaign must be completed. During 1981 and 1982, $3.84 million was raised toward the goal of $7.65 million.

Our development program continued working to increase the Infirmary's endowments which will help to insure our future. During 1982, the tenth floor was named in honor of William H. Claflin III; plans were underway to dedicate the twelfth floor to Dr. Moses Lurie and the Eye Pathology Laboratory in honor of Dr. David Cogan. After studying various options for reorganization to provide for the protection of our endowments, a new corporate structure has been designed. The reorganization creates a foundation (the Foundation of the Massachusetts Eye and Ear Infirmary, Inc.) for the management of endowments and a real estate corporation (Circle Company, Inc.), but leaves the Infirmary's management intact.

Concurrently we determined that the time had come to make an assessment of our medical staff organization. To this end, a committee chaired by Robert Heyssel, M.D., Executive Vice President and Director, The Johns Hopkins Hospital, was appointed to review the organizational structure of the Departments of Ophthalmology and Otolaryngology. The committee's recommendations, to be acted upon in 1983, are based on interviews with members of the medical staff, management and trustees. The Board of Managers will further consider the views of all interested parties during deliberations on the committee's recommendations.

The Infirmary's building fund and development programs continue to provide the capital for exemplary facilities for research and patient care.

Annual Report for 1982

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Publications

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I give _____
dollars to the Foundation of the Massachusetts Eye and Ear Infirmary, Inc., to be used for such of its purposes as may be directed by the Foundation's Board of Directors.

Massachusetts
Eye and Ear Infirmary
243 Charles Street
Boston, Massachusetts 02114

Members of the Corporation, Management and Staff Appointments

Corporation

As of December 1, 1982

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1981 Maynard Goldman
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As of September 30, 1982

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Rosanne Ring
Barbara Schnider

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***Deceased*

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As of December 1, 1982

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Charles T. Wood

Ophthalmology

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Claes H. Dohlman, M.D.
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Charles D.J. Regan, M.D.
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Richard J. Simmons, M.D.
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Richard A. Thoft, M.D.

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Lloyd M. Aiello, M.D.
Daniel M. Albert, M.D.
A. Robert Bellows, M.D.
Eliot L. Berson, M.D.
Charles K. Beyer, M.D.
Don C. Bienfang, M.D.
Frederick B. Breed, M.D.
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Richard L. Dallow, M.D.
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Roland E. Houle, M.D.
Joseph C. Kim, M.D.
Mohandas M. Kini, M.D.
Joel A. Kraut, M.D.
Eeva-Liisa Martola, M.D.
Deborah Pavan-Langston, M.D.
Robert A. Petersen, M.D.
Ronald C. Pruett, M.D.
Perry Rosenthal, M.D.
Baruch J. Sachs, M.D.
John G. Sebestyen, M.D.
Harvey H. Slansky, M.D.
Felipe I. Tolentino, M.D.
Silvio R. von Pirquet, M.D.
David S. Walton, M.D.
Donald R. Weis, M.D.
Michael Wiedman, M.D.

**Deceased*

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C. Stephen Foster, M.D.
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Evangelos S. Gragoudas, M.D.
David Z. Greenseid, M.D.
Arthur S. Grove, Jr., M.D.
Tatsuo Hirose, M.D.
David S. Hutchison, M.D.
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Arnold J. Kroll, M.D.
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Clement Trempe, M.D.
Paul F. Vinger, M.D.

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Francis J. West, M.D.

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Patrick Ho, M.D.
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William Mestrezat, M.D.
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Edward Galbavy, M.D.
Harry Geggel, M.D.
David Mark, M.D.
John S. Minkowski, M.D.
Hunson Kaz Soong, M.D.

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John McDermott, M.D.
Leon G. Partamian, M.D.
Claudia U. Richter, M.D.
Charles Shrader, M.D.
Omah Singh, M.D.

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Samuel G. Jacobson, M.D.

Plastic-Orbit Service
R. Patrick Yeatts, M.D.

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Alfred L. Hurst, M.D.
Thomas R. Klein, M.D.
Robert E. Klotz, M.D.
Robert H. Lofgren, M.D.
William W. Montgomery, M.D.
Harold F. Schuknecht, M.D.

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C. Edward Jackson, M.D.
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James H. Kelly, M.D.
Ely A. Kirschner, M.D.
Jon B. Liland, M.D.
Stephen A. Smith, M.D.

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Howard G. Smith, M.D.
Alfred D. Weiss, M.D.

Consulting Staff

Consulting Chief of Otolaryngology
LeRoy A. Schall, M.D.

Senior Consulting Surgeons in Otolaryngology
Walter J.E. Carroll, M.D.
J. Charles Drooker, M.D.
John R. Frazee, M.D.
Robert L. Goodale, M.D.
Edgar M. Holmes, M.D.
John E. McKeigue, M.D.
Daniel Miller, M.D.
John R. Richardson, M.D.
Bernard Zonderman, M.D.

Senior Consulting Associate Surgeons in Otolaryngology
Aram Roopenian, M.D.
John C. Trakas, M.D.

Honorary Staff

Associate Surgeons in Otolaryngology
Charles Kent, M.D.
Herman J. Sternstein, M.D.

Assistant Surgeon in Otolaryngology
Elizabeth DeBlois, M.D.

Assistant in Otolaryngology
Frank W. Brady, M.D.

Associate Staff

Associate Surgeon in Otolaryngology
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Assistant Surgeon in Otolaryngology
John N. Vandemoer, M.D.

Assistants in Otolaryngology
Marvin P. Fried, M.D.
Terry J. Garfinkle, M.D.

Consultant in Prosthodontia
Peter E. Goldberg, D.D.S.

Clinical Associate in Otolaryngology-Voice Therapy
David B. McClosky

Clinical Research Associate Staff

Clinical Research Associates
Aaron R. Thornton, Ph.D.
Barbara H. Sprague, Ph.D.

Services

Subdivision of Plastic and Reconstructive Surgery
Richard L. Fabian, M.D.,
Chief of Plastic and Reconstructive Surgery
Aram Roopenian, M.D.,
Senior Consulting Associate Surgeon in Plastic and Reconstructive Surgery
Richard C. Webster, M.D.,
Associate Surgeon in Plastic and Reconstructive Surgery
Edward E. Jacobs, Jr., M.D.,
Associate Surgeon in Plastic and Reconstructive Surgery
William G. Lavelle, M.D.,
Associate Surgeon in Plastic and Reconstructive Surgery
John N. Vandemoer, M.D.
Assistant Surgeon in Plastic and Reconstructive Surgery
Howard M. Ecker, M.D.,
Assistant in Plastic and Reconstructive Surgery

Subdivision of Otolaryngologic Pathology
Max L. Goodman, M.D., *Director*
Ben Z. Pilch, M.D., *Assistant in Pathology*

Head and Neck Tumor Clinic
William W. Montgomery, M.D.,
Director
Robert E. Klotz, M.D., *Associate Director*

Endoscopy Service
William W. Montgomery, M.D.,
Director
Thomas J. Mulvaney, M.D.,
Associate Director

Esophageal Voice Classes
Eve Herbert, *Director*

Audiology
Rhoda K. Morrison, *Director*

Pediatric Services
Roland D. Eavey, M.D., *Director*

Residents

Fred G. Arrigg, Jr., M.D.
Wayne Barber, M.D.
Alfonso Barrera, M.D.
Edward D. Donovan, M.D.
Thomas L. Eby, M.D.
James R. Gross, M.D.
Aina J. Gulya, M.D.
George Kazda, M.D.
Thomas J. Kereiakes, M.D.
Thomas A. Mustoe, M.D.
Steven D. Rauch, M.D.
Jo Shapiro, M.D.
Kevin A. Shumrick, M.D.
Seth R. Thaller, M.D.
Robert C.Y. Wang, M.D.
Mark C. Weissler, M.D.
Michael A. Williams, M.D.

Department of Anesthesiology

Active Staff

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Porter H. Smith, M.D.

Anesthesiologists
John V. Donlon, Jr., M.D.
Jin Woo Kim, M.D.

Associate Anesthesiologists
Malcolm J. Heslop,
Kathryn E. McGoldrick, M.D.

Assistant Anesthesiologists
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Jonathan Moss, M.D., Ph.D.
Janine T. Rodrigues-Saldanha, M.D.
Lily G. Tabbal, M.D.

Assistants in Anesthesiology
Ismail S. Sensel, M.D.
Heinrich R. von Helmstatten, M.D.

Associate Staff

Assistants in Anesthesiology
Part-Time
Joseph A. Gallo, M.D.
W. Andrew Kofke, M.D.
Daniel L. Nozik, D.D.S.
Carl E. Rosow, M.D.

Medical Unit

Active Staff

Chief of Medical Unit
Lloyd Axelrod, M.D.

Consultants in Internal Medicine
Lloyd Axelrod, M.D.
Gerald Doyle, M.D.
Richard A. Field, M.D.

Epidemiologist and Consultant in Infectious Disease; Associate Medical Director of Bacteriology
Ann S. Baker, M.D.

Consultant in Oncology
Philip Amrein, M.D.

Associate Staff

Consultants in Internal Medicine
Gershwin Blyden, M.D.
William Bornstein, M.D.
F. Richard Bringhurst, M.D.
Joseph Garner, M.D.
Robert Schooley, M.D.
Katharine Treadway, M.D.
Randall Zusman, M.D.

Consultant in Medicine (Pediatrics)
Ruth Liberfarb, M.D.

Department of Radiology

Active Staff

Chief of Radiology
Alfred L. Weber, M.D.

Associate Radiologists
K. Jack Momose, M.D.
James T. Rhea, M.D.

Consulting Staff

Consultants in Radiotherapy
Milford D. Schulz, M.D.
Herman D. Suit, M.D.
Chiu-Chen Wang, M.D.

Clinical Associates in Radiology
John R. Hesselink, M.D.
Jeanne Keller, M.D.

Clinical Services

Clinical Laboratory
Eleanor Bushman, *Chief Medical Technologist*

Microbiology
Joan Haaf, *Bacteriologist*

Operating Room
Evelyn Brewster, R.N. *Director of Surgical Services*

Pharmacy
Paul O'Connor, *Director*

Social Service
S. Madeline Shipsey, *Director*

Department of Ophthalmology

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Claes H. Dohlman, M.D., *Director*
Cecil K. Drinker, M.B.A., *Research Administrator*
Daniel M. Albert, M.D.
P. John Anderson, Ph.D.
Frank G. Berson, M.D.
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Hong-Ming Cheng, Ph.D.
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Thaddeus P. Dryja, M.D.
David L. Epstein, M.D.
James Epstein, Ph.D.
Stephen J. Fricker, M.D.
**Mary Kathryn Gillis, Ph.D.
W. Morton Grant, M.D.
Judith Jedziniak-McGregor, Ph.D.
Thomas M. Richardson, M.D.
Johan Zwaan, M.D., Ph.D.

Librarian
Judith C. Nims, *Acting*

Berman-Gund Laboratory for the Study of Retinal Degenerations
Eliot L. Berson, M.D., *Director*
Roslyn Neustadt, *Laboratory Administrator*
Ross B. Edwards, Ph.D.
Michael A. Sandberg, Ph.D.
Joyce Schenkein, Ph.D.
Susan Y. Schmidt, Ph.D.

Research Associates in Ophthalmology
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Hong-Ming Cheng, Ph.D.
Ross B. Edwards, Ph.D.
James Epstein, Ph.D.
Judith Jedziniak-McGregor, Ph.D.
Michael A. Sandberg, Ph.D.
Susan Y. Schmidt, Ph.D.
Ernst G. Wolf, Ph.D.

**Deceased*

Research Fellows in Ophthalmology
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Kathleen Lamping, M.D.
Jane Lubin, M.D.
Alfredo Sadun, M.D.
Delia Sang, M.D.
Joyce Schenkein, Ph.D.
Lois Smith, M.D.
Cathy Stein, Ph.D.
Wang Shuo-jing, M.D.
Wang Wen-ji, M.D.
John K. Wolfe, Ph.D.

Department of Otolaryngology

Eaton Peabody Laboratory
Nelson Y.S. Kiang, Ph.D., *Director*
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John J. Rosowski, Ph.D.
Eric M. Rouiller, Ph.D.
David K. Ryugo, Ph.D.
William F. Sewell, Ph.D.
Thomas F. Weiss, Ph.D.

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Robert S. Kimura, Ph.D., *Director*

Evoked Response Audiometry Laboratory
Joseph B. Nadol, Jr., M.D., *Co-director*
Aaron R. Thornton, Ph.D., *Co-director*

Histopathology Laboratory
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Research Fellows in Otolaryngology
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Shang Rong Shi, M.D.
Hideichi Shinkawa, M.D.
Erik Teig, M.D.

Department of Ophthalmology

Chairman
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Professors of Ophthalmology
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Richard J. Simmons, M.D.
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***Deceased*

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Lawrence I. Rand, M.D.
Johanna Seddon, M.D.
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John V. Thomas, M.D.
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David P. Berry, M.D.
Helene Boisjoly, M.D.
Gary Borodic, M.D.
Salim Butrus, M.D.
Jeremy Chess, M.D.
Edward Galbavy, M.D.
Harry Geggel, M.D.
David S. Gendelman, M.D.
Phillip M. Gendelman, M.D.
Jeffrey P. Gilbard, M.D.
Barry Golub, M.D.
Sidney Gutmann, M.D.
Charles Hill, M.D.
Samuel G. Jacobson, M.D.
Douglas Johnson, M.D.
Shalom J. Kieval, M.D.
Mark A. Latina, M.D.
Jerry LeClaire, M.D.
Steven Leibowitz, M.D.
David Mark, M.D.
Mary Jane McCarron, M.D.
John McDermott, M.D.
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John J. Papale, M.D.
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Richard Sidd, M.D.
Lois Smith, M.D.
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Barbara Gibson, M.D.
Olafur Gudmondsson, M.D.
Kathleen Lamping, M.D.
John H.K. Liu, Ph.D.
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Geoffrey J. Schmidt, Ph.D.
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Cathy Stein, Ph.D.
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William R. Wilson, M.D.

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Stuart H. Bentkover, M.D.
Yale J. Berry, M.D.
Elaine D. Carrol, M.D.
Louise I. DiGregorio, M.D.
Allan G. Edwards, M.D.
Richard L. Fabian, M.D.
Edward J. Glinski, M.D.
William L. Hayden, M.D.
Alfred L. Hurst, M.D.
Edward E. Jacobs, Jr., M.D.
Roy A. Johnson, M.D.
Ely A. Kirschner, M.D.
Thomas R. Klein, M.D.
Robert E. Klotz, M.D.
John M. Kurkjian, M.D.
William G. Lavelle, M.D.
Jon B. Liland, M.D.
Joseph A. Moretti, M.D.
Thomas J. Mulvaney, M.D.
David E. Nash, M.D.
Charles M. Norris, M.D.
Joseph H. Oyer, M.D.
Angelo J. Pappanikou, M.D.
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Edward J. Reardon, M.D.
Stephen A. Smith, M.D.
John C. Trakas, M.D.

Instructors in Otolaryngology
Ellen M. Friedman, M.D.
Michael Joseph, M.D.
William Sewell, Ph.D.
Barbara Sprague, Ph.D.
Kristine Strand, Ed.D.
Marilyn Park-Warren, M.D.

Lecturers on Otolaryngology
Werner D. Chasin, M.D.
David S. Isenberg, Ph.D.
Walter A. Rosenblith, ING. RAD.
Martin C. Schultz, Ph.D.
Eric Teig, M.D.
Richard C. Webster, M.D.

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Research Associate in Otolaryngology
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Shang Rong Shi, M.D.
Hideichi Shinkawa, M.D.

Clinical Fellows in Otolaryngology
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Wayne Barber, M.D.
Alfonso Barrera, M.D.
Edward D. Donovan, M.D.
Thomas L. Eby, M.D.
Mark S. Granich, M.D.
James R. Gross, M.D.
Aina J. Gulya, M.D.
Michael P. Joseph, M.D.
George Kazda, M.D.
Thomas J. Kereiakes, M.D.
Thomas A. Mustoe, M.D.
Steven D. Rauch, M.D.
Jo Shapiro, M.D.
Kevin A. Shumrick, M.D.
Seth R. Thaller, M.D.
Robert C.Y. Wang, M.D.
Mark C. Weissler, M.D.
Michael A. Williams, M.D.

Department of Anesthesiology

Chairman of Anesthesia
Porter H. Smith, M.D.

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Jin Woo Kim, M.D.
Kathryn E. McGoldrick, M.D.
Porter H. Smith, M.D.

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Jonathan Moss, M.D.

Clinical Instructors in Anesthesiology
Malcolm J. Heslop, M.D.
Charles G. Kelley, M.D.
Janine T. Rodrigues-Saldanha, M.D.
Lily G. Tabbal, M.D.

Medical Unit

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Richard A. Field, M.D.

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Lloyd Axelrod, M.D.
Ann S. Baker, M.D.
Randall Zusman, M.D.

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F. Richard Bringhurst, M.D.
Robert Schooley, M.D.
Katharine Treadway, M.D.

Clinical Instructor in Pediatrics
Ruth Liberfarb, M.D.

Research Fellows in Medicine
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Joseph Garner, M.D.

Department of Radiology

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James T. Rhea, M.D.

Professor Emeritus of Radiation Therapy
Milford D. Schulz, M.D.

Professors of Radiation Therapy
Herman D. Suit, M.D.
Chiu-Chen Wang, M.D.

Employees

Over Twenty-five
Evelyn Brewster, R.N.
Dorothy Campanella
Mary DiVincenzo
W. Morton Grant, M.D.
John Irwin, M.D.
Dorothy Landers, R.N.
Roger Lane
Rita Lovely
Charlotta Michalek
Lloyd Ramsdell
S. Madeline Shipsey
Barbara Smith, R.N.
Charles Snyder
Ann Stromberg
Charles T. Wood

Twenty-five Years
Barbara Healy
Nelson Kiang, Ph.D.

Twenty Years
Hilda Coyne
Gladys Johnson, L.P.N.
Clara Sellon, R.N.

Fifteen Years
Alma Cruickshank
Earl Jackson
Rhoda Morrison
Carol Ota
H. Lorraine Sargent, R.N.
Ruby Scarbrough

Ten Years
Evelyn Atkins
Josiah Atkinson
Michael Beckerman, C.R.N.A.
Barbara Beckman
Lully Blaise
Michael Borges
Winfield Browne
Antonetta Buccella, R.N.
Barbara Bushey, R.N.
Nancy Lee Cole
Philip Coleman
June Corman
Arthur Doherty
Erskine Eastmond
Patricia Egan-Hows
Maria Forde
Markley Foster
Vera Francis
Christine Gomes
Judith Grant
Gaelmarie Greene
Jennifer Hamlin
Marie Healey
Camy Jean-Mary
Margaret Lawrence
Jean Leong
Dorothy Magliocco, C.R.N.A.
Monica McDavid
Michael McHugh
Emmerson Moore
Catherine Mullis
Dorothy Murkland
Joseph Nadol, M.D.
Edith Nicholson
Esther Nuestro, R.N.
Ana Perdomo
Robert Reed
Lorna Rogers
Alice Sarno
Thomas Slowey
Pamela Smith
Theophilos Squires
Robert York

Five Years
Jose Ameijeiras
P. John Anderson, Ph.D.
Paulos Avramidis
Lloyd Axelrod, M.D.
David Baxter
Edward Bortone
Dorothy Boyle
Franklin Bringhurst, M.D.
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Edith Dayley
Mary Donovan
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Mary Kathryn Gillis, Ph.D.
Deborah Glantz
B. Helen Glover
Mary Joan Haaf
Vernita Headen
Susan Henshaw
Anne Hilliard
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Robert Keller, C.R.N.A.
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Evelyn Leonin
Linda Lund
Antoinette Lynch
Eileen Lynch
Marilyn Maloney, L.P.N.
Judith J. McGregor, Ph.D.
William McLaughlin
Norma Miller
Guy Nelson
Gladys Norris, R.N.
Kathleen O'Day, R.N.
Joan Pasquinelli
Emma Perito
Diane Piva, L.P.N.
Thomas Richardson, M.D.
Jean Trelawny
E. Joseph Villeneuve, C.R.N.A.
Arnold Williams
Maryellen Wood, R.N.

Volunteers

Over 100 Hours
Scott Chapin
Genevieve Covell
Scott Isabelle
Ezra Merrill
Nancy Osgood

Honor Roll
Merle Barry
Emma Buckley
Bernadette Butler
Evelyn Cunningham
Jacqueline Daley
Barbara Dawson
Geraldine DiLorenzo
Margaret Duncan
Mary Eagan
Mary Higgins
Florence Knight
Marydell Lipscomb
Stephanie Lombardo
Helen McEvoy
Alba Reppucci
Ruth Shapiro
Marvin Siegel
Alice Silverman
Charles Snelling
Michael Tyler

Massachusetts
Eye and Ear Infirmary
243 Charles Street
Boston, Massachusetts 02114

Massachusetts Eye and Ear Infirmary

		1982	1981
Inpatient Hospital	**Admissions:**		
174 beds	Eye patients	8,095	7,912
	ENT patients	4,346	4,460
	Total admissions	12,441	12,372
	Operations:		
	By Eye House Staff	934	896
	By Eye Attending Staff	7,171	7,176
	Total Eye operations	8,105	8,072
	By ENT House Staff	693	690
	By ENT Attending Staff	3,507	3,587
	Total ENT operations	4,200	4,277
	Total operations	12,305	12,349
	Discharges:	12,407	12,388
	Death	14	14
	Autopsies	29%	14%
	Patient days	54,032	55,498
	Average patient census	148	152
	Average length of stay	4.34	4.49
	Bed utilization	85%	87%
Outpatient Department	Eye Clinic		
	Total Eye visits	46,594	45,595
	ENT Clinic		
	Total ENT visits	19,135	22,247
	Total OPD visits	65,729	67,842
Emergency Ward	Eye cases	20,091	23,394
	ENT cases	13,523	13,671
	Total	33,614	37,065
Ambulatory Surgery	Eye cases	3,797	2,681
	ENT cases	2,101	2,035
	Total	5,898	4,716
Special Services	Audiology	11,030	11,191
	Pattern Evoked Response	852	526
	Electroretinography (tests)	830	839
	Fluorescein (tests)	2,947	2,869
	Low vision	335	311
	Neuro-ophthalmology	769	1,066
	Otoneurology (tests)	543	356
	Ultrasonography (tests)	642	363
	Radiology (exams)	28,889	29,942
	Laboratories		
	Eye pathology (specimens)	4,623	4,457
	ENT pathology (specimens)	6,069	6,052
	Clinical laboratory (procedures)	119,120	111,772
	Bacteriology (cultures)	12,845	13,627

Operating Funds Balance Sheet
September 30, 1982

Current assets:		
Cash		$ 17,088
Accounts receivable	$12,541,652	
Less allowance for doubtful receivables	1,359,037	
		$11,182,615
Investments, at cost (quoted market value $3,878,461)		3,703,991
Inventories		344,539
Prepaid expenses		112,864
Deposits on equipment lease		85,200
Estimated contractual adjustments		649,538
Total current assets		$16,095,835
Other assets:		
Property, plant and equipment	$50,782,691	
Less accumulated depreciation	15,659,899	
Total other assets		$35,122,792
Total operating funds		$51,218,627

Current liabilities:		
Current installments of long-term debt		$ 980,000
Accounts payable		2,463,341
Note payable		741,909
Accrued expenses		1,233,734
Due to other funds		914,718
Total current liabilities		$ 6,333,702
Other liabilities:		
Long-term debt, less current installment		14,188,061
Total liabilities		$20,521,763
Fund balances		
General operating fund	$ 3,868,308	
Depreciation fund — unrestricted	6,873,825	
Plant fund	19,954,731	
Total fund balances		$30,696,864
Total operating funds		$51,218,627

Statement of Revenue and Expenses
September 30, 1982

Patient service revenue:		
Adjustment to patient revenue for uncollectible accounts, free care and contractual allowances		$36,752,669
		3,932,364
Net patient service revenue:		$32,820,305
Other operating revenue (including $9,550,300 from research and other specific purpose funds):		12,345,027
Total operating revenue		$45,165,332
Operating expenses:		
Patient service (including depreciation)	$36,034,110	
Research and other specific purpose direct expense	9,550,300	
Total operating expenses		$45,584,410
Hospital net loss from operations		$ (419,078)

Income from investments	$1,683,143
Gifts and bequests	1,326,377
Donated income—various estates	445,848
	$3,455,368

Restricted funds
Balance sheet
September 30, 1982

Specific purpose funds:			
Cash	$ 3,292,476	Accounts payable	$ 120,502
Investments at cost (quoted market value $2,797,400)	2,813,359	Fund balances	
Due from other funds	1,331,338	Special purpose	4,427,058
		Temporary	2,082,621
		Unexpended restricted income	806,992
	$ 7,437,173		$ 7,437,173
Endowment Funds:			
		Due to other funds	$ 606
		Equity in undistributed security pool gains	2,887,807
Cash	$ 45,208	Fund balances	
Due from investment pools	71,716	Income restricted	1,923,188
Investments at cost (quoted market value $14,392,279)	13,634,013	Income unrestricted	8,491,334
		Quasi-endowment	448,002
	$13,750,937		$13,750,937
Building Fund			
		Due to other funds	$ 416,014
		Accounts payable	608,572
		Note payable	107,824
Construction in progress	$ 4,499,256	Fund balance	3,366,846
	$ 4,499,256		$ 4,499,256

"That the deaf shall hear

and the blind shall see

with the help of God"

Massachusetts Eye and Ear Infirmary

Having undergone only slight modification since its conception in 1827, the seal of the Massachusetts Eye and Ear Infirmary is still in use today. By image and in verse this historic hallmark represents the mission of the Infirmary. The center of the seal, as depicted on the cover, is filled with the image of a rayed sun rising over the waves of the sea. The rising sun denotes sight and light and the breaking waves denote hearing and sound. Inscribed around the seal is the Infirmary's motto, "DEO. Surdi audiunt. Juv. Caeci. Vident." Translated, "That the deaf shall hear and the blind shall see with the help of God," this motto was inspired by a verse from the Gospel according to St. Matthew.

Annual Report for 1983

THE MASSACHUSETTS EYE AND EAR INFIRMARY is a unique resource for those seeking treatment of visual, speech, and hearing disorders. Our modern inpatient and ambulatory facilities provide comprehensive specialty services to patients from all over the world.

As a teaching affiliate of Harvard Medical School, the Infirmary trains medical students in the specialties of Ophthalmology and Otolaryngology. Many graduates of the Infirmary's residency and fellowship training programs have become leaders in their disciplines throughout the world.

Over the past century and a half, the Infirmary has pioneered in the development of new diagnostic and treatment modalities and has maintained a leadership position in basic and applied research. Today, as in the past, we work at preserving and restoring the gifts of sight, hearing, and speech for all who come through our doors.

Report of the Chairman

NINETEEN EIGHTY THREE was a period of transition for the Massachusetts Eye and Ear Infirmary. We completed our new building, reorganized our corporate structure, and installed a new President and Chief Executive Officer.

Charles T. Wood, left us after 17 years as General Director. All of us who have been associated with him throughout his 28-year tenure at the Infirmary are grateful for his leadership, dedicated service, and achievements.

Dr. Ephraim Friedman joined us in September 1983 after almost a decade as Dean of the Albert Einstein College of Medicine in New York City. During the previous decade, he served at Boston University first as Chairman of the Department of Opthalmology and then as Dean of the Medical School. From 1972 to 1974, he also served on the Infirmary's Board of Managers. Dr. Friedman was a resident in Ophthalmology at the Infirmary and a fellow in the Howe Laboratory between 1959 and 1965. We are delighted to welcome him back. Working with Dr. Friedman is Margarete Arndt, the Infirmary's Executive Vice President and Chief Operating Officer.

Ephraim Friedman, M.D.
President

August R. Meyer
Chairman

In 1983, the Infirmary established the Foundation of the Massachusetts Eye and Ear Infirmary, a holding company whose sole purpose is the enhancement of the fiscal well-being of the Infirmary. One subsidiary of the Foundation is the Circle Company, a for-profit real estate company. The other is the Massachusetts Eye and Ear Infirmary which continues as a not-for-profit hospital.

Under the new structure, I became Chairman of the Infirmary's Board of Managers and Melville Chapin, Board Chairman since 1971, became Chairman of the Foundation. Dr. Friedman serves as President of all three entities: the Foundation, the Infirmary, and the Circle Company.

This past year was the one in which we completed the physical transformation of the Infirmary that began in 1968. The Infirmary has been transformed from a small elegant 19th century building to a 16-story tower. Our new 52 million dollar facility is the result of the effort of many, but particularly those of Melville Chapin, the Building Program's Campaign Chairman; Frank Christian, William Claflin, Henry H. Meyer and Charles T. Wood.

Since 1824, our mission has remained constant: to offer dedicated, state-of-the-art patient care, provide the finest training programs, and conduct seminal research. We shall continue on this course.

"The Infirmary has been tranformed from a small elegant 19th century building to a 16-story tower."

"We have the unique capability not only to train students clinically but to prepare them for teaching and research careers."

Report of the President

THE MASSACHUSETTS EYE AND EAR INFIRMARY is one of the world's leading hospitals, and I am honored to be its President. I would, at this time, like to identify some of the directions in which I believe the Infirmary should move during the next decade.

This institution has gained international preeminence as a research and training center and the quality of the care provided to our patients has earned the Infirmary its reputation as a premiere clinical facility. We have a dedicated Board, an exceptionally talented staff, facilities second to none, and virtually unlimited educational and scientific opportunities through our academic and clinical affiliations. Endowed as we are with these resources, we have the responsibility to aspire to even greater preeminence.

While we have many options we should, in my opinion, concentrate primarily on those goals achievable only by institutions as strong as the Infirmary. Many departments of Ophthalmology and Otolaryngology, for example, train excellent clinicians but few have the resources to develop leaders in academic medicine. We have the unique capability not only to train students clinically but to prepare them for teaching and research careers. With excellent residency programs already in place, this can be best accomplished by the further enhancement of our fellowship programs.

"The Infirmary is in a unique position to develop programs which set the industry standard. Our new Ambulatory Surgery Unit is a good example of just such a program."

In the coming months and years, we should strengthen our leadership position among the ophthalmic and otologic research centers of the world. We should aggressively recruit the most talented young investigators and provide them with the necessary resources. As we expand our basic and clinical research capability, we must assure a proper role for our library. In order to remain the intellectual focus of the Infirmary, the library as well as our archives, should be relocated to a more central and prominent location.

The Infirmary has reason to be proud of its state-of-the-art clinical programs; the world of medicine is changing rapidly, however, and we should be prepared to respond to these changes briskly and flexibly. Our excellent inpatient facility, Departments of Anesthesiology, Internal Medicine, Nursing, and our outstanding support services place us in a unique position not only to respond to changing medical practice but to develop programs which set the industry standard. Our new ambulatory surgery unit is a good example of just such a program.

Although research advances and the introduction of high technology during the recent decades have had a profound impact on the care of those acutely ill, the habilitation and rehabilitation of those with chronically poor vision, impaired hearing and speech have remained neglected parts of our clinical and academic armamentarium. In the future we should develop programs not only to correct these deficiencies but integrate them within a major Infirmary Center for Human Communication.

None of these goals will be achievable without the many talented members of the Infirmary family: some investigators seeking to help prevent blindness and others to understand some of the causes of deafness, nurses caring for premature babies with serious visual problems, staff creating facilities such as our own steam generating plant, and all who educate and train our next generation.

The Infirmary will have to achieve these goals in a heavily-regulated and financially-strained environment. Despite the inexorable pressure of hospital cost containment laws such as the Commonwealth's Chapter 372 and the generally depressed state of the hospital industry, the Infirmary will, in my opinion, continue to flourish. The support of our loyal and uniquely broad-based constituency will enable us to carry on our tradition of excellence and innovation.

In summary, the major challenge for the Infirmary is the achievement of its full potential. If we truly avail ourselves of our resources, there is no realistic limit to what we can do and what we can become. This is a great hospital; it is our responsibility to make it even greater.

"The quality of care provided to our patients has earned the Infirmary its reputation as a premiere clinical facility."

Cochlear Implantation: An Advance in the Treatment of Deafness

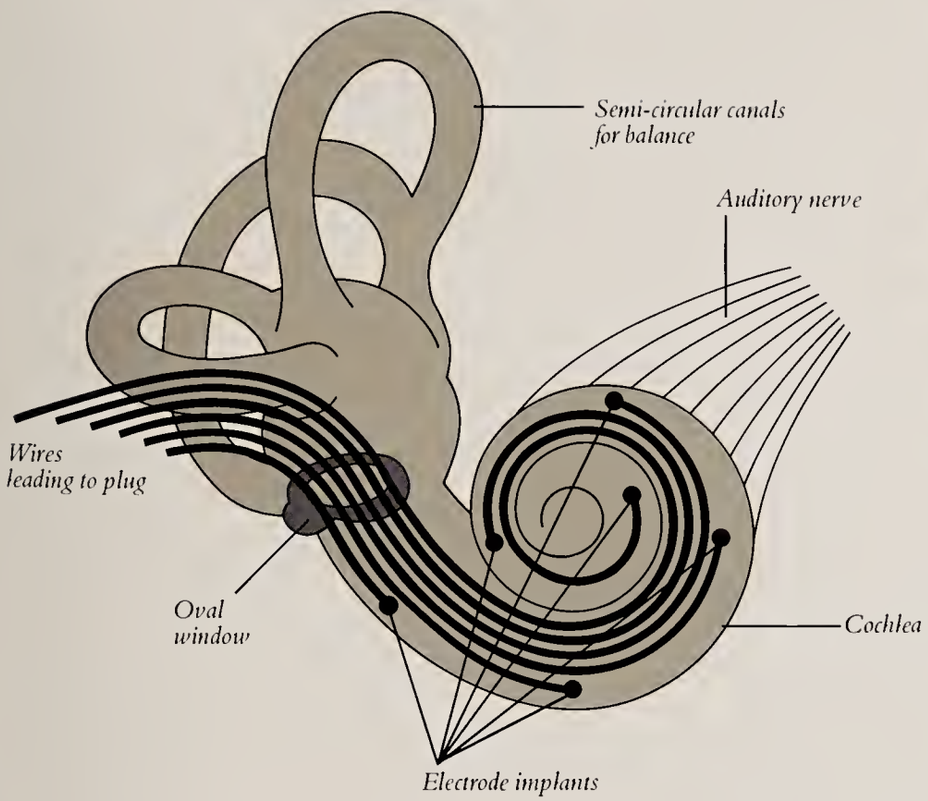
RESEARCH IS THE KEY to our mission of providing the best possible care. The talents of our basic research and clinical staff enhance our ability to prevent and treat disorders of hearing and speech.

For the past quarter of a century, the Eaton Peabody Laboratory of Auditory Physiology, one of the most advanced and sophisticated facilities of its kind in the world, has made pioneering contributions toward our understanding of the mechanism of hearing. Nelson Kiang, Ph.D., Eaton Peabody Professor of Communication Sciences, directs the laboratory, a collaborative research and teaching effort among the Massachusetts Eye and Ear Infirmary, Harvard Medical School, and Massachusetts Institute of Technology. A large team including electrical engineers, computer scientists, acousticians, physiologists, anatomists, neurochemists, neurologists and otologists has produced unique insights into the ways in which the brain processes, codes, and analyzes the sounds we hear.

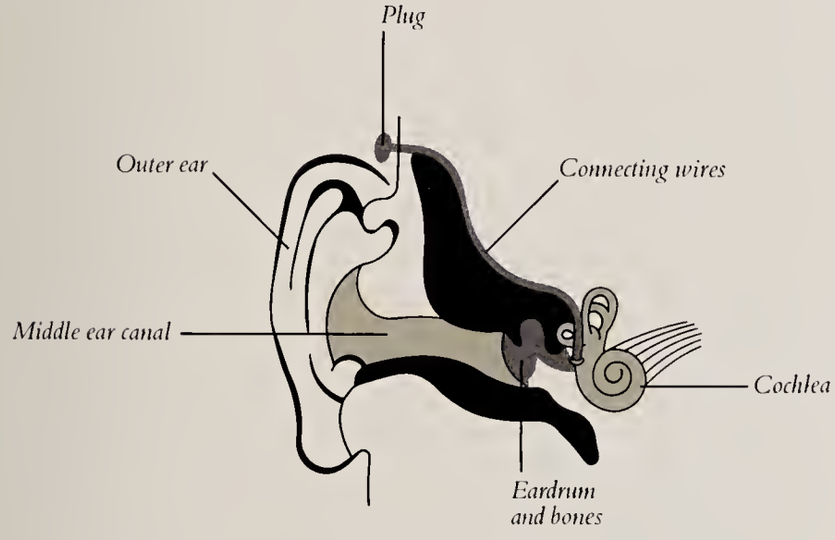
In order to further our understanding of the underlying pathological processes affecting the ear, Harold F. Schuknecht, M.D., Chief of Otology and Laryngology at the Infirmary, established the Histopathology Laboratory. Serving also as Chairman of the Department and LeCompte Professor of Otology at Harvard Medical School for more than two decades, he is the leading authority on the patho-physiology of deafness as well as an innovative surgeon, teacher, and clinician. His studies are milestones in our knowledge of deafness.

Among the most debilitating types of deafness are those caused by disorders of the inner ear. Unlike conductive hearing loss, caused by middle ear disease, sensory neural hearing loss, the result of inner ear dysfunction, has not been surgically correctable until recently. We have had little to offer the profoundly deaf but a hearing aid, which is of limited usefulness in many cases.

Inner Ear Implant



Harold F. Schuknecht, M.D.
Chief of Otology and Laryngology



Hearing aids are of limited usefulness for the profoundly deaf because they only make sounds louder. Cochlear implants, on the other hand, do provide some measure of speech recognition for these individuals especially in conjunction with lipreading.

The sound associated with the spoken word is received and processed by a pocket-sized computer which transforms it into an electrical signal. This signal is transmitted to wire electrodes implanted in the cochlea, the spiral, bony structure in the inner ear that houses the auditory nerve. The brain then processes the information which is received via the auditory nerve into the perception of a human voice.

The past decade witnessed the development of a method to bypass the malfunctioning part of the inner ear and electrically stimulate the auditory nerve by surgically implanting electrodes in the cochlea. The Infirmary is one of the few research centers evaluating cochlear implantation. The staff in our basic science laboratory is further refining the cochlear implant, and our clinical staff will be evaluating its effectiveness. This innovation in the treatment of deafness is founded upon the research contributions of Drs. Kiang, Schuknecht, and many others on the staff.

In addition to these programs the Department of Otolaryngology is proud of its audiology, clinical and research otology services, a newly constructed electron microscopy laboratory, and its research fellowship program. As a result we may be approaching the time when we can make a reality out of our institutional motto, "That the deaf shall hear... with the help of God."

The organ of Corti, the part of the ear sensitive to sound, is shown magnified X860 by a scanning electron microscope. The part of the eye sensitive to light is shown on Page 20.

"Within the past decade, lasers have revolutionized the management of diabetic retinopathy."

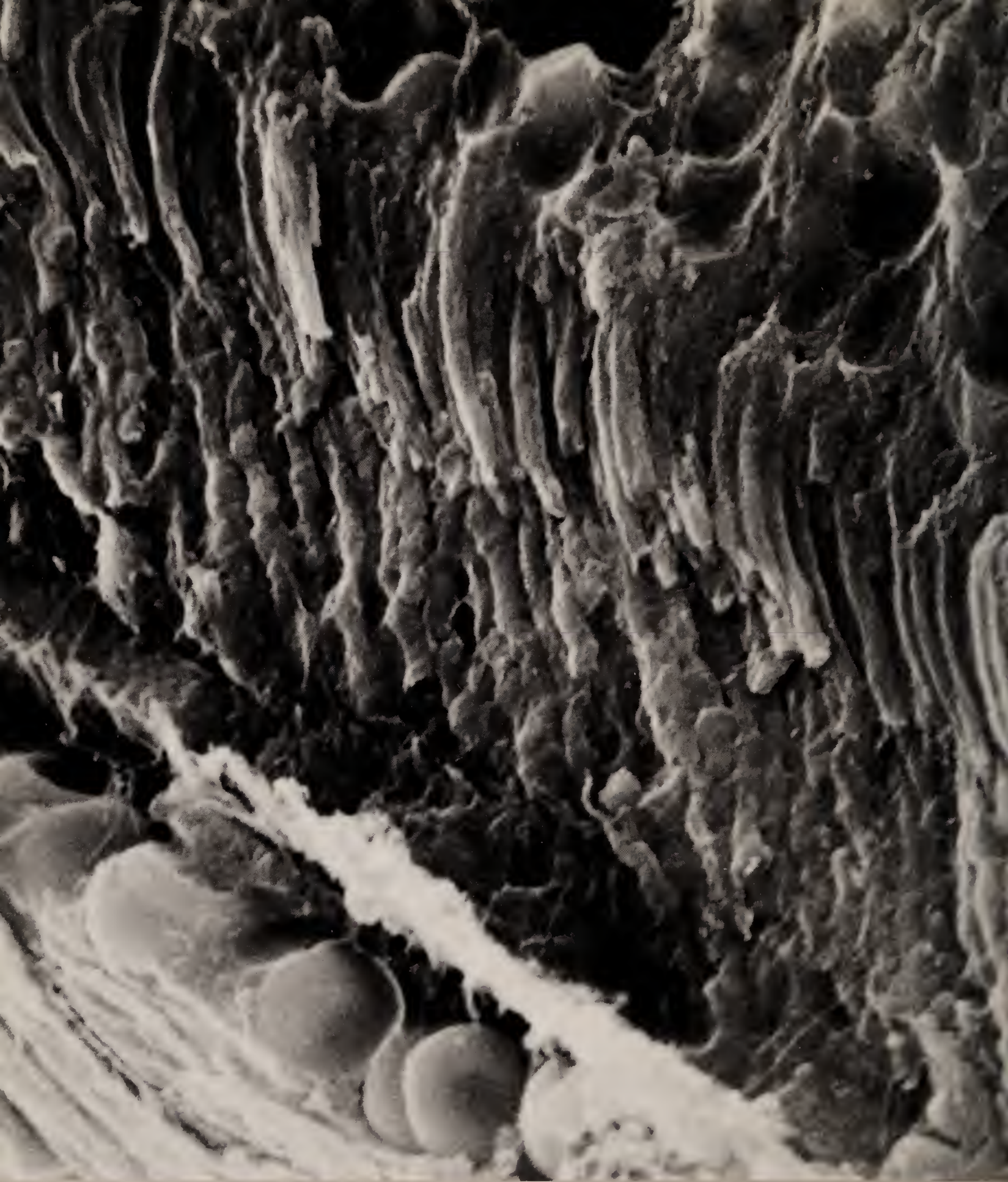
Lasers and the Eye

THE DEPARTMENT OF OPHTHALMOLOGY has received international recognition for its contributions to the understanding of the structure and function of the eye and the prevention and treatment of disorders of the eye. The names Lucien Howe and Berman-Gund are synonymous with the best of eye research, and the Cogan Laboratory has rapidly emerged as an important facility dedicated to the study of the pathology of the eye.

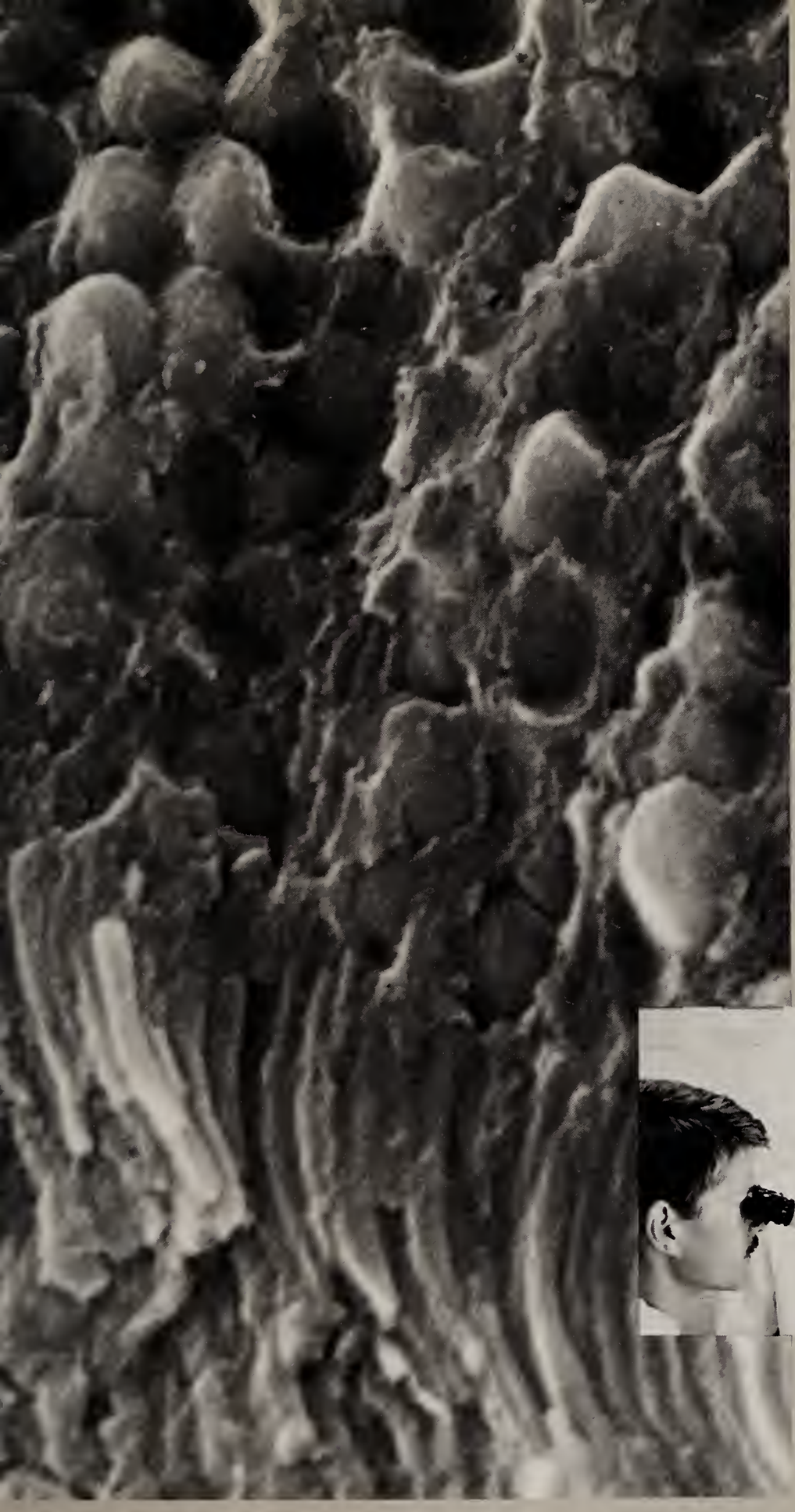
Among the most exciting of the newer basic and clinical research programs are those dealing with lasers. Laser light is intense, directional, and pure. As bloodless scalpels, lasers can make delicate incisions, cauterize minute blood vessels, and destroy eye tumors. Within the past decade, lasers have revolutionized the management of diabetic retinopathy. The expanded application of the laser in the treatment of glaucoma is under study and appears increasingly promising.

In the case of most lasers, the absorption of the concentrated beam of laser light by the tissues results in intense local heating. The newer YAG laser, on the other hand, cuts with precisely focused shock waves that last a few billionths of a second. Among the uses of the YAG laser is the incision of the cloudy membrane which develops in as many as one-half of the nation's half-million cataract patients within five years of surgery. The light from other lasers would pass right through it, but the YAG laser beam, focused on the taut membrane, causes a series of minute explosions and the cut tissue parts like a curtain.

Because the eye is an organ open to light, it is appropriate that light energy from the laser be employed to treat diseases of the eye. Despite recent progress, the application of lasers to ocular problems is still in its infancy. A research team at the Infirmary is actively investigating the basic processes of laser-tissue interaction with the dual goals of improving existing laser treatment of glaucoma, cataract, and retinal disease, and the development of new clinical laser therapies.



The retina, the structure within the eye sensitive to light, is shown magnified X2400 by a scanning electron microscope.



In order to accelerate the rate of progress of this research, a Laser Center has been established at the Infirmary and is currently under construction. This Center combines a laser research facility with a patient treatment area. Construction has been funded through the generosity of Albert L. and Annette S. Morse. The Morse Laser Center will house the largest laser eye research facility in the nation, perhaps the world. Our Center, along with our other basic and clinical research efforts, will pioneer ways to treat and prevent eye disorders so that "...the blind shall see with the help of God."

Claes H. Dohlman, M.D.
Chief of Ophthalmology

"Within their tiny and fragile bodies, there is an extremely fine line between safety and compromise of vital functions."

Pediatric Anesthesia: The Challenge of the Premature Baby

INFANTS UNDERGOING SURGERY present a special challenge to the anesthesiologist. Within their tiny and fragile bodies, there is an extremely fine line between safety and compromise of vital functions. The smaller the child, the more exacting the anesthesia.

The Department of Anesthesia at the Massachusetts Eye and Ear Infirmary is currently rising to that challenge. Premature infants suffering from retrolental fibroplasia (RLF), a disease that can result in partial or complete blindness, are currently undergoing vitrectomy surgery. Weighing as little as one-and-three-quarter pounds at birth, they often undergo surgery at an age as early as three months when they may weigh only five to six pounds. With their immature hearts and lungs these infants do not tolerate anesthesia as well as older babies. Other medical problems often limit their tolerance to surgery even further.

The anesthesiologist must give meticulous attention to every detail from pre- to post-operative care. Minimal undetected deviation from normal heart rate, blood pressure, or fluid balance can be life-threatening in premature infants. The monitoring of their respiratory and cardiac systems begins prior to the administration of anesthesia, continues throughout the surgical procedure, which may last several hours, and concludes with the recovery and the post-operative period.

Even something seemingly as simple as measuring blood pressure may present a special challenge in the case of the premature infant. In order to measure blood pressure accurately the anesthesiologist uses an instrument called a Doppler placed on the arm and a stethoscope placed over the baby's chest wall.

Once sufficient anesthetic depth has been reached, a tube is inserted into the infant's larynx to maintain patency of the airway. The tube, often a mere three millimeters in diameter, must be precisely and gently inserted to prevent any swelling of the already narrow airway, which could compromise the baby's breathing in the post-operative period.

During surgery the anesthesiologist carefully monitors the flow of intravenous fluid. The requirements of fluid during surgery must be carefully calculated as there is a very small margin of safety in such tiny babies. Administration of either too little or too much fluid could result in compromise of the infant's cardiovascular, respiratory, or renal system.

Many infants who have had vitrectomies can now see, although the long-term benefits of this operation for the treatment of RLF are still being evaluated. Whatever type of surgical procedure evolves for this condition, its success will depend to a great extent on the absolute precision with which anesthesia is given.

We note with sorrow the passing of our distinguished colleagues:

Virgil G. Casten, M.D.
Senior Consulting Surgeon
Department of Ophthalmology

William H. Evans, M.D.
Alumnus 1924
Department of Ophthalmology

Mary Kathryn Gillis, Ph.D.
Research Associate
Department of Ophthalmology

Kevin Hill, M.D.
Alumnus 1961
Department of Ophthalmology

Taylor R. Smith, M.D.
Surgeon
Department of Ophthalmology

George McLaughlin
Trustee 1952-1983
Board of Managers 1971-1977

We Are Grateful to the Many Donors Whose Support Makes it Possible for the Infirmary to Continue its Tradition of Excellence.

The following donors have given $25,000 or more to the Infirmary during 1983.

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Mr. & Mrs. Edward L. Bowles
Mrs. Edward V. French
Mrs. Susan Morse Hilles
Mr. & Mrs. Ellery Rogers
Mr. & Mrs. Monte J. Wallace

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MEEI Full-Time Staff of Ophthalmology
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Estate of Mary E. Newbury
Estate of Katherine R. Redding
Estate of Mary E. Tennis

Corporations
First National Bank of Boston
Morse Shoe, Inc.

The following members of our medical staff have donated $25,000 or more to the Infirmary.

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Dr. & Mrs. Howard M. Ecker
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Perry Rosenthal, M.D.
Dr. & Mrs. Harold F. Schuknecht
Dr. & Mrs. Richard J. Simmons
Dr. & Mrs. Albert Sloane
*Taylor R. Smith, M.D.
Dr. & Mrs. Silvio R. vonPirquet
Anonymous

*In Memoriam

Massachusetts Eye and Ear Infirmary
Members of the Corporation, Management and Staff Appointments
Publications
Financial Statements

Massachusetts Eye and Ear Infirmary
Members of the Corporation, Management and Staff Appointments

Trustees

As of April 24, 1984

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1948 Miss Amelia Peabody, *honorary*
1951 Melville Chapin
1951 Henry K. Porter
**1952 George A. McLaughlin, Sr.
1955 Richard P. Chapman
1955 Weston Howland, Jr.
1957 William L. Saltonstall
1963 Thomas B. Frost
1965 George M. Lovejoy, Jr.
1965 Mrs. John Lowell
1966 Francis S. Hill, *honorary*
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1981 Maynard Goldman
1981 John C. Kane, Jr.
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1982 Gerhard M. Freche
1982 Christian Halby
1982 Jonathan M. Keyes
1982 Ezra Merrill
1982 Ward Willett
1983 T. John Caveney
1983 Ephraim Friedman, M.D.
1983 Joseph Linsey
1983 John F. Palmer
1983 Manuel Rosenberg
1983 Wayne D. Thornbrough
1983 Charles T. Wood

**Deceased*

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Ephraim Friedman, M.D., *President*
J. Frank Gerrity, *Treasurer*
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Melville Chapin
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*Edward E. Jacobs, Jr., M.D.
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Robert T. P. Storer, Jr.
James I. Summers
Robert D. Williams
Mrs. Frederick R. H. Witherby

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Claes H. Dohlman, M.D.
J. Frank Gerrity
B. Thomas Hutchinson, M.D.
John C. Kane, Jr.
William G. Lavelle, M.D.
August R. Meyer
Harold F. Schuknecht, M.D.
Porter H. Smith, M.D.
William F. Spang
James I. Summers

**Appointed by the Commonwealth*

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As of December 7, 1983

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Herbert W. Gray
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As of December 7, 1983

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Amiram Shapiro, M.D.
Barry Smith, M.D.

Electrophysiology
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Pathologist
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Assistant Pathologist
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Peter E. Goldberg, D.D.S.

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Clinical Research Associates
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Barbara H. Sprague, Ph.D.

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William G. Lavelle, M.D., *Associate Surgeon*
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Comparative Statistics: Fiscal 1983–1982
Massachusetts Eye and Ear Infirmary

		1983	1982
Inpatient Hospital	**Admissions:**		
174 Beds	Eye Patients	8,526	8,095
	ENT Patients	4,335	4,346
	Total admissions	**12,861**	**12,441**
	Operations:		
	By Eye House Staff	886	934
	By Eye Attending Staff	7,718	7,171
	Total Eye operations	**8,604**	**8,105**
	By ENT House Staff	805	693
	By ENT Attending Staff	3,366	3,507
	Total ENT operations	**4,171**	**4,200**
	Total operations	**12,775**	**12,305**
	Discharges:	12,886	12,407
	Death	11	14
	Autopsies	1%	29%
	Patient days	52,461	54,032
	Average patient census	144	148
	Average length of stay	4.08	4.34
	Bed utilization	83%	85%
Outpatient Department	Eye Clinic		
	Total Eye visits	**42,661**	**46,594**
	ENT Clinic		
	Total ENT visits	**18,833**	**19,135**
	Total OPD visits	**61,494**	**65,729**
Emergency Ward	Eye cases	18,920	20,091
	ENT cases	15,219	13,523
	Total	**34,139**	**33,614**
Ambulatory Surgery	Eye cases	4,256	3,797
	ENT cases	2,274	2,101
	Total	**6,530**	**5,898**
Special Services	Audiology	11,630	11,030
	Pattern Evoked Response	1,199	852
	Electroretinography (tests)	784	830
	Fluorescein (tests)	2,705	2,947
	Low vision	284	335
	Neuro-ophthalmology	721	769
	Otoneurology (tests)	575	543
	Ultrasonography (tests)	694	642
	Radiology (exams)	27,219	28,889
	Laboratories		
	Eye pathology (specimens)	5,366	4,623
	ENT pathology (specimens)	5,798	6,069
	Clinical Laboratory (procedures)	118,440	119,120
	Bacteriology (cultures)	11,518	12,845

Financial Statements
Massachusetts Eye and Ear Infirmary

Operating Funds Balance Sheet

September 30, 1983

Current assets:		
Cash		$ 2,689,902
Accounts receivable	$10,802,623	
Less allowance for doubtful receivables	1,430,817	
		$9,371,806
Investments, at cost (quoted market value $4,282,938)		3,991,874
Inventories		796,591
Prepaid expenses		108,724
Total Current assets		**$16,958,897**
Other assets:		
Property, plant and equipment	$57,635,659	
Less accumulated depreciation	17,741,325	
Total other assets		**$39,894,334**
Total operating funds		**$56,853,231**

Current liabilities:		
Current installments of long-term debt		$ 1,100,000
Accounts payable		3,200,940
Note payable		500,000
Accrued expenses		1,667,489
Deferred revenue		300,000
Due to other funds		268,612
Estimated contractual adjustments		210,722
Total current liabilities		**$ 7,247,763**
Other liabilities:		
Long-term debt, less current installment		14,858,255
Total liabilities		**$22,106,018**
Fund balances:		
General operating fund	$ 4,215,408	
Depreciation fund—unrestricted	5,828,380	
Plant fund	24,703,425	
Total fund balances		**$34,747,213**
Total operating funds		**$56,853,231**

Statement of Revenue and Expenses

Year ended September 30, 1983

Patient service revenue:		**$40,185,671**
Adjustment to patient revenue for uncollectible accounts, free care and contractual allowances		4,846,300
Net patient service revenue:		**$35,339,371**
Other operating revenue (including $11,624,760 from research and other special purpose funds):		14,603,881
Total operating revenue		**$49,943,252**
Operating expenses:		
Patient service (including depreciation)	$38,764,267	
Research and other specific purpose direct expense	11,624,760	
Total operating expenses		$50,389,027
Hospital net loss from operations		($ 445,775)

Income from investments	$2,016,729
Gifts and bequests	2,955,036
Donated income—various estates	63,832
	$5,035,597

Restricted funds
Balance sheet
September 30, 1983

Specific purpose funds:			
Cash	$ 3,532,689	Fund balances	
Investments at cost (quoted market value $2,573,601)	2,473,016	Special purpose	$ 4,418,686
Due from other funds	764,257	Temporary	1,437,906
		Unexpended restricted income	913,370
	$6,769,962		**$6,769,962**
Endowment Funds:			
		Due to other funds	$ 15,884
		Equity in undistributed security pool gains	3,471,620
		Fund balances	
Cash	$ 43,732	Income restricted	2,081,688
Due from investment pools	9,775	Income unrestricted	8,771,329
Investments at cost (quoted market value $18,022,487)	15,047,944	Quasi-endowment	760,930
	$15,101,451		**$15,101,451**
Building Fund			
		Due to other funds	$ 479,761
Cash	$ 130,200	Accounts payable	494,487
Construction in progress	2,473,758	Fund balance	1,629,710
	$2,603,958		**$2,603,958**

Massachusetts Eye and Ear Infirmary
243 Charles Street, Boston, Massachusetts 02114

1984

Annual

Report

Massachusetts Eye and Ear Infirmary

Report of the Chairman

It is a sign of the health and vitality of the Massachusetts Eye and Ear Infirmary that the past year's accomplishments include a great deal of effective planning for the future. Under the able leadership of Dr. Ephraim Friedman, president, and Mrs. Margarete Arndt, executive vice president, we have appraised what the future is likely to hold in store for us and have taken decisive action to meet the challenges ahead.

A truly historic decision was made in the appointment of Joseph B. Nadol, Jr., M.D., as the new chief of otolaryngology and chairman of the Department of Otology and Laryngology at Harvard Medical School. Following the retirement of Harold F. Schuknecht, M.D., chief of otolaryngology for 23 years, the Infirmary and Harvard Medical School conducted a nationwide search for a candidate with outstanding clinical and academic qualifications. A graduate of Harvard College and Johns Hopkins School of Medicine, Dr. Nadol joined the Infirmary staff in 1975 and has distinguished himself as a leading physician, researcher, and medical administrator. We look forward to his long and productive tenure.

Mindful of the rapidly changing health care environment, the Infirmary last year developed a comprehensive strategic plan. Five task forces were established to work in the following areas: 1) ambulatory surgery services, 2) relations with industry and corporations, 3) referral base development, 4) finance and reimbursement and, 5) outpatient services reorganization. Members of the Board of Trustees, medical staff, and administration came together on each task force and developed strategies and programs that will, I am certain, strengthen the Infirmary in all of these areas.

Mindful of the rapidly changing health care environment, the Infirmary last year developed a comprehensive strategic plan.

The Infirmary has acted in an equally decisive manner with regard to fiscal affairs. In recognition that the future holds in store many possible financial and regulatory scenarios, we have taken a more conservative approach to our accounting and budgetary process. We can now be confident of passing on to posterity a fiscally secure institution.

It is especially gratifying to me that the past year has also seen a strengthening of the Board of Trustees. We welcomed to our ranks several outstanding new members from industry, science, and the public sector, and I look forward to an even greater level of board participation and commitment than we have enjoyed in the past.

The past year demonstrated that the Infirmary is, indeed, a preeminent institution. Flexibility, decisiveness, and courage—these qualities were of great significance during 1984 and will continue to serve us well in the future.

August R. Meyer
Chairman of the Board of Trustees

Report of the President

One plans for the future and, in the process, discovers that the future has arrived. That has been the case for many members of the medical staff, administration, and board of trustees at the Massachusetts Eye and Ear Infirmary during the past year.

In 1983–84 we undertook a thorough strategic planning effort and sought to define specific steps that should be taken to ensure the Infirmary's continued good health in the future. In the early months of the fiscal year, the challenge of completing our strategic plan and developing a series of working committees and task forces required the attention of many of us at the Infirmary. We did not know at that time that the latter half of the year would bring unexpected challenges as the result of a rapidly changing health care environment.

In particular, the anticipated change to a greater use of ambulatory surgery arrived much sooner than was expected. Instead of a transition period lasting a year or more, the Infirmary faced the need to significantly expand our ambulatory surgical facilities in just six weeks.

We demonstrated to the medical community and to the general public that the Infirmary is well equipped to handle the complexities of today's health care environment.

In November 1984, the Massachusetts Peer Review Organization mandated that most cataract extractions and a number of other procedures be performed on an ambulatory basis beginning December 15, 1984. Peer Review Organizations had been created by federal legislation to work toward reducing inpatient lengths of stay, to encourage shifting of surgery to the most cost-effective settings, and to monitor patient care. They had been given the authority to approve or disapprove of Medicare reimbursement, and in this way could influence how cases were to be handled.

An Infirmary task force was assembled to deal with this new situation. Members of the Infirmary's medical, administrative, and nursing staffs met to plan an expanded Ambulatory Surgery Center that could handle the increased volume of cases. Space on the 10th floor was redesigned to accommo-

date reception, waiting, preoperative and postoperative areas, and a patient escort service was established—all in time to meet the December deadline.

What transpired was a casebook example of how to respond to rapid change. Despite the extraordinary pressure that was brought to bear on many members of the Infirmary community, we gained greater confidence in our abilities and a greater knowledge of our strengths. We demonstrated to the medical community and to the general public that the Infirmary is well equipped to handle the complexities of today's health care environment. Most importantly, not a single patient suffered in any way because of this change.

In a similar fashion, the latter half of the past year saw the Infirmary take a decisive step

Only a handful of medical institutions in the world have the Infirmary's resources—a rich tradition of medical and scientific excellence, an uncommonly talented and loyal staff, a dedicated board of trustees, and a sound financial base.

toward reorganization of our non-surgical outpatient services. The Infirmary has for some time housed two types of outpatient services: clinics which are staffed largely by residents and fellows working under the supervision of senior medical staff, and private medical practices, which have been

established by members of the senior staff who are geographically based within the Infirmary. In recent years the number of patients seen in our clinics has steadily declined, while the private practices have experienced either steady or increased volume.

In order to protect the training program and to develop more thoroughly integrated clinical programs at the Infirmary, we are moving toward a single system of outpatient care. This new service is currently under study by a task force of medical staff, administrators, and trustees.

I am certain that this pattern of rapid response reflects institutional strength and resilience. Only a handful of medical institutions in the world have the Infirmary's resources—a rich tradition of medical and scientific excellence, an uncommonly talented and loyal staff, a dedicated board of trustees, and a sound financial base. These resources served us well through the challenging year just past, and I am confident that they will continue to sustain us as we step into the future.

Ephraim Friedman, M.D.

Report of the Department of Otolaryngology

This has been a year of transition for our department. Harold F. Schuknecht, M.D., has become chief emeritus of otolaryngology. The department is fortunate in his decision to continue with patient care, temporal bone research, and teaching at the Infirmary. William Wilson, M.D., has assumed the position of chief of otolaryngology at George Washington University, where I am sure he will continue the traditions of the Infirmary in which he shared for over a decade.

We welcome to our department several new staff members, including Steven Rauch, M.D., who has taken on the responsibility of coordinating otolaryngology training for the Harvard Medical students, and Dr. Richard Moscicki, who is a member of the full-time staff of the Department of Allergy and Immunology at Massachusetts General Hospital and joins us as a joint appointee in order to specialize in allergy and immunologic problems of the head and neck. Six new part-time staff members have also joined the department.

Two new subspecialty clinics, otology and pediatrics, have been established in an effort to further improve the quality of care delivered to our patients. Both clinics will be staffed by a dedicated cadre of full- and part-time staff.

We are now planning for a major reorganization of outpatient services; this includes a hearing aid dispensary and a speech pathology and vocal therapy outpatient service. These will be the first otolaryngologic components of the new Rehabilitation Center at the Infirmary.

Nineteen eighty-four indeed has been a period of transition for the department. It is a time of opportunity to build on the Infirmary's long tradition of excellence in patient care, teaching, and research.

The Cochlear Implant Project, which is aimed at the rehabilitation of the profoundly deaf by electrical stimulation of the inner ear and directed by Donald K. Eddington, Ph.D., has received FDA investigational approval. The first prosthesis was implanted in December 1984. Joining the Cochlear Implant Project team this year was Robert Hall, Ph.D.

Our teaching program this year includes, for the first time, the entire second-year class of the Harvard Medical School. The residency

program in otolaryngology has been expanded from three to four years in order to provide more intensive training in an ever-expanding specialty. It is hoped that in the future the fourth year of otolaryngologic training can be tailored to the needs, interests, and abilities of our individual residents. Numerous individuals spent many hours to provide a program in basic science and continuing medical education for members of the professional staff, and William Montgomery, M.D., presented an outstanding course in surgical anatomy. A research fellowship program for post-residency training in research pertinent to the specialty of otolarynology has been approved by the National Institutes of Health and will begin in July 1985.

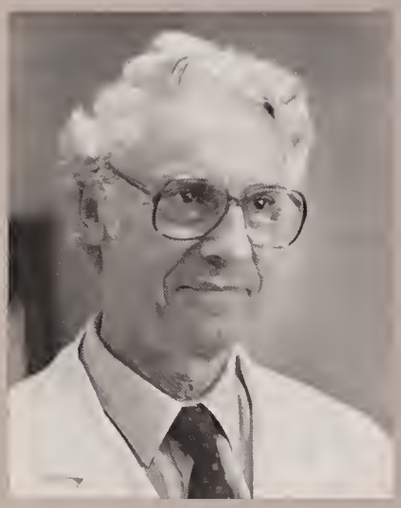
The residency program in otolaryngology has been expanded from three to four years in order to provide more intensive training in an ever-expanding specialty.

The department's research efforts at the Infirmary have increased, funded by nine NIH and two private grants. The Eaton Peabody Laboratory of Applied Auditory Physiology, under the direction of Nelson Kiang, Ph.D., continues to seek new information in the area of auditory physiology and anatomy and has assumed an increasing role in clinical research activities. The Otopathology Laboratory, under the direction of Dr. Harold Schuknecht with the technical expertise of Ms. Diane Jones and in conjunction with the National Temporal Bone Bank program, of which the Infirmary constitutes the Eastern and National Center, continues its important work in investigation of inner ear pathology at a light microscopic level. The Electron Microscopy Laboratory, under the direction of Robert Kimura, Ph.D., has been renovated and continues its investigation into the ultrastructural anatomy and pathology of the inner ear of animals and humans.

Nineteen eighty-four indeed has been a period of transition for the department. It is a time of opportunity to build on the Infirmary's long tradition of excellence in patient care, teaching, and research. We are grateful to our managers and trustees for making this effort possible.

Joseph B. Nadol, Jr., M.D.

Report of the Department of Ophthalmology



The accomplishments of the Department of Opthalmology in 1984 have started us positively toward our overarching goal—to strengthen the department, particularly in the subspecialties, and to sustain the quality of teaching and cutting-edge research. The primary focus for the moment is recruitment of both full-time academic staff and visiting clinical staff in order to improve and expand the outpatient services.

In the past year George E. Garcia, M.D., was appointed associate chief of ophthalmology and director of the General Eye Service. He has already streamlined the administration in this area and overseen improvements in the physical arrangements, equipment, and personnel. The Neuro-Ophthalmology Service has been stabilized by the appointment of a new director and professor, Simmons Lessell, M.D. We were fortunate to recruit Perry Rosenthal, M.D., to direct the Contact Lens Service as a now separate unit, and further recruitment efforts will be directed toward appointing a basic scientist to fill a new Harvard professorship position. Finally, we were pleased this year to accept ten highly qualified young ophthalmologists onto the staff.

The recruitment and reorganization efforts implemented this year will undoubtedly enhance the Infirmary's position as a national leader in our specialty.

Although the department also lost several full-time faculty members, the great strides we made toward strengthening the staff over the past year will stand us in good stead as we implement plans to improve our services.

Research efforts also continue to grow at the Infirmary despite a generally harsh national fiscal climate. The department's grant base has been increasing and we continue to attract top investigators and fellows. Laboratory construction, such as the new Hilles Immunology Laboratory, the pediatric

research laboratory, and expanded pathology research space, has been completed. Funding for these projects has come from both private and governmental sources.

On the clinical side, several studies in the subspecialty areas have been yielding exciting results, and the Infirmary's long-standing tradition of dynamic interaction between clinicians and basic scientists still prevails.

Despite a decline in the overall outpatient census, the subspecialty services such as retina, cornea, and glaucoma are flourishing. The Pediatric Service and the Neuro-Ophthalmology Service moved into expanded quarters this year, while a new Laser Unit

Several studies in the subspecialty areas have been yielding exciting results, and the Infirmary's long-standing tradition of dynamic interaction between clinicians and basic scientists still prevails.

and an Epidemiology Unit are under construction. Other sharply focused sub-units of the specialty services are planned to take advantage of rapid developments in technology and to provide competitive services for an increasingly mobile patient population.

Additionally, these concentrated units will provide improved forums for teaching and for

increased interaction between staff and residents, fellows, and students.

Plans are also underway to establish a program which will integrate Infirmary outpatient services. This system will foster greater opportunities for contact between residents and full-time staff and will, at the same time, enhance care for all Infirmary patients.

The recruitment and reorganization efforts implemented this year will undoubtedly enhance the Infirmary's position as a national leader in our specialty. The fully integrated teaching, research, and patient care programs resulting from the careful planning now underway will result in a stronger yet more flexible department prepared to face all challenges which may lie ahead.

Claes H. Dohlman, M.D.
Chief of Ophthalmology

The Year in Review

■ Edwin Blakeslee Dunphy, M.D., formerly chief of ophthalmology at the Infirmary for 22 years, died in May 1984. He was 88. Dr. Dunphy was a member of the Infirmary community for 61 years. His leadership was reflected by the many achievements of his professional and personal life, his tenures as president of both the New England and the American Ophthalmological Societies, and his founding of the Massachusetts Society for the Prevention of Blindness.

■ LeRoy A. Schall, M.D., 92, who served as chief of otolaryngology at the Infirmary from 1939 to 1959, died in April 1985. Dr. Schall was professor emeritus of otology and laryngology at the Harvard Medical School, and past president of numerous medical societies, including the American Academy of Ophthalmology and Otolaryngology, the New England Otolaryngological Society, and the American Board of Otolaryngology.

■ The Infirmary was among the first of Massachusetts institutions and businesses to implement the Right to Know Law, enacted in June 1984. The law specifies that employers must educate their employees about substances they may encounter in the workplace, and make available information regarding those substances. Under the direction of Richard Congdon, safety officer, and with the assistance of a firm specializing in health and environmental assessments, substances were identified and catalogued and employee education seminars were conducted.

■ In May, the Infirmary, along with the Lowell Institute, hosted the Lowell Lecture Series in Medicine. Prominent figures in the Boston and Massachusetts health care field addressed "The Future of Health Care in America: Questions of Human Values, Technology, and Cost."

■ In September a unique volume documenting the Infirmary's past was published. *Massachusetts Eye and Ear Infirmary—Studies on its History*, was written by Charles Snyder, who served as the Infirmary's archivist and librarian for 31 years. Focusing on the Infirmary's first hundred years, the book details the lives and duties of the institution's physicians and personnel, as well the social climate of the time.

■ Nearly 200 employees and volunteers were honored in November at the annual Infirmary Service Awards Ceremony. Employees with service records of 5 to 40 years received gifts and congratulations during the awards ceremony, which was held in the Meltzer Auditorium. A luncheon for recipients followed the ceremony.

■ The November United Way Campaign at the Infirmary was an unparalleled success. Herbert Kirshnit, director of dietary and chairman of the campaign, reported that Infirmary employee contributions totaled approximately $21,000, exceeding the campaign's goal of $18,000.

■ The first cochlear implant in New England was performed at the Infirmary in December. Performing the surgery was Joseph B. Nadol Jr., M.D., chief of otolaryngology. Donald K. Eddington, Ph.D., director of the Infirmary's Cochlear Implant Research Laboratory, collaborated on the procedure and helped develop the implant. The operation involves the implantation of electrodes in the inner ear of a deaf person that directly stimulate the auditory nerve, improving lip-reading ability and providing a measure of actual hearing. The procedure attracted considerable attention from the press.

■ In January David G. Cogan, M.D., director of neuro-ophthalmology at the National Eye Institute, Bethesda, MD, former chief of ophthalmology at the Massachusetts Eye and Ear Infirmary, and former director of the Howe Laboratory, visited the Infirmary for two weeks. Cogan attended resident teaching and slide-reading sessions and delivered a presentation on ocular motility abnormalities.

■ New members of the Infirmary's administration include Ruth Aaron, vice president of ambulatory and ancillary services; Joseph Goodman, director of public affairs; Pierre (Pete) Henry, vice president of fiscal services; Charles Jarvis, vice president of support services; and James Keenan, vice president for development.

■ In December the Infirmary greatly expanded its ambulatory surgery services. Space was redesigned on the tenth floor to accommodate the Ambulatory Surgery Center. A separate pediatric ambulatory surgery suite, with its own operating room, was opened in May. Ruth Aaron, vice president of ambulatory and ancillary services, and Judith Harvey, R.N., vice president and director of nursing, helped to direct the transition.

■ The Infirmary is one of seven centers currently participating in a National Eye Institute-sponsored study to determine if laser therapy or topical medicine—currently the conventional approach—is the best primary treatment for open-angle glaucoma. The study is under the direction of David L. Epstein, M.D., director of the Glaucoma Consultation Service. Open-angle glaucoma accounts for 50 to 80 percent of the estimated 2 million glaucoma cases in this country.

■ A new publications program for the Infirmary was instituted by the Office of Public Affairs. New publications include *Contact*, a quarterly newsletter featuring news and information about the Infirmary community; *Alumni News*, a biannual publication for the Infirmary alumni; *Update*, a periodic bulletin from the president of the Infirmary; and *The Week Ahead*, a weekly calender listing events of interest to Infirmary personnel.

■ There were several new appointments for members of the Department of Ophthalmology during the year. George E. Garcia, M.D., was appointed as associate chief of ophthalmology and director of the General Eye Service, and Frank G. Berson, M.D., became assistant chief of ophthalmology. Daniel Albert, M.D., was named Cogan Professor of Ophthalmology at the Harvard Medical School. B. Thomas Hutchinson, M.D., received the Man of Vision Award from the National Society to Prevent Blindness Massachusetts Affiliate.

■ A $400,000 grant from the Jessie B. Cox Charitable Trust has helped to provide the start-up funds for a multidisciplinary Rehabilitation Center at the Infirmary. Under the direction of C. Patricia McCabe, the center will offer medical and counseling services for hearing, vision, and speech disorders to patients and their families. Some of the center's services are now available, including a low vision service and low vision aid dispensary. One of the center's staff members, Andrew Baker, O.D., a hearing-impaired optometrist, is caring for the vision of hearing-impaired patients in the General Eye Service. Other services, including a hearing aid dispensary, are planned for the near future.

■ In the Department of Otolaryngology, Harold F. Schuknecht, M.D., was named as the chief emeritus of otolaryngology. Schuknecht was chief of otolaryngology at the Infirmary for 23 years. He stepped down from his position in June 1984, but is continuing his clinical and research work at the Infirmary. Thomas Mulvaney, M.D., was appointed as medical director of otolaryngologic ambulatory and emergency services. Robert S. Kimura, Ph.D., and Thomas Weiss, Ph.D., were honored by the National Institute of Neurological and Communicative Disorders and Stroke, which granted them the Javits Neuroscience Investigator Awards for their research work.

■ A fundraising campaign has been launched to construct, equip, and endow a new library. The goal of the campaign is to raise $2.5 million, $2 million of which would serve as a permanent endowment fund.

■ Jeffrey Gilbard, M.D., and Scheffer Tseng, M.D., Ph.D., both clinical fellows in the Cornea Service, have obtained promising results in a clinical trial treating dry eye patients with a topical ointment containing vitamin A. In most cases, clinical symptoms of dryness, irritation of the eyes, and light sensitivity were relieved after treatment.

Massachusetts Eye and Ear Infirmary
1983–1984

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Leo T. Chylack, Jr., M.D.
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Richard P. Floyd, M.D.
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Simmons Lessell, M.D.
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Frank G. Berson, M.D.
Chester R. Boulris, M.D.
Eugene C. Ciccarelli, M.D.
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David Z. Greenseid, M.D.
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James W. Rosenberg, M.D.
Kenneth A. Stampfer, M.D.
Daniel W. Tolpin, M.D.
David M. Tracy, M.D.
Clement Trempe, M.D.
Paul F. Vinger, M.D.
Johan Zwaan, M.D.

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Mark B. Abelson, M.D.
Maida P. Antigua, M.D.
Michael J. Bradbury, M.D.
Stephen H. Cobb, M.D.
John B. Constantine, M.D.
Stephen R. Deppermann, M.D.
Anthony J. Fraioli, M.D.
Kweku N. Ghartey, M.D.
Edward F. Goodman, M.D.
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Donald J. D'Amico, M.D.
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David D. Donaldson, M.D.
Mahlon T. Easton, M.D.
Trygve Gundersen, M.D.
Carl C. Johnson, M.D.
Brendan D. Leahey, M.D.
Sumner D. Liebman, M.D.
Henry A. Mosher, M.D.
Ichiro D. Okamura, M.D.
Abraham Pollen, M.D.
Karl Riemer, M.D.
Charles L. Schepens, M.D.
Earl S. Seale, M.D.
Albert E. Sloane, M.D.
Garrett L. Sullivan, M.D.
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Robert A. Petersen, M.D.

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Alexander R. Gaudio, M.D.
Robert Kinder, M.D.
Arthur M. Morrissey, M.D.
Bertha Offenbach, M.D.
Richard M. Robb, M.D.

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Robin Cook, M.D.
David A. Hill, M.D.

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Elena Barraquer, M.D.
Neil M. Bressler, M.D.
Susan B. Bressler, M.D.
Roberto de Bara, M.D.
James P. Dailey, M.D.
George Fournier, M.D.
Donald Frambach, M.D.
David S. Gendelman, M.D.
Barry Golub, M.D.
Sharon Gross, M.D.
Sidney Gutmann, M.D.
Neal E. Hall, Jr., M.D.
Peter S. Hersh, M.D.
John A. Irvine, M.D.
Kevin Kaufman, M.D.
Diana H. Kersten, M.D.
Jan Kylstra, M.D.
Mark A. Latina, M.D.
Mary Jane McCarron, M.D.
John J. Papale, M.D.
Paul Schacknow, M.D.
Oliver Schein, M.D.
Paul J. Wasson, M.D.
Richard Wetzig, M.D.

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Steven Bodine, M.D.
Andrew Eller, M.D.
Joseph Googe, M.D.
Nabil Jabbour, M.D.
Jerry LeClaire, M.D.
John Matthews, M.D.
Salomon Melgen, M.D.
Jerry Sebag, M.D.
Kenneth Sharpe, M.D.
Ingrid Taylor, M.D.
Richard Weber, M.D.

Cornea
Richard Bazin, M.D.
Jeffrey P. Gilbard, M.D.
Leslie D. Ormerod, M.D.
Rhodes Stevens, M.D.
Scheffer Tseng, M.D., Ph.D.

Glaucoma
Eve Higginbotham, M.D.
David Lee, M.D.
Shlomo Melamed, M.D.
David Palmer, M.D.
Robert Rosenquist, M.D.
Dana Schoenleber, M.D.
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Plastics/Orbit
Roxana Barad, M.D.
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Electrophysiology
Paul Sieving, M.D.

Pathology
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Otolaryngology

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William L. Hayden, M.D.
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Joseph A. Moretti, M.D.
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Pathologist
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Ben Z. Pilch, M.D.

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***deceased*

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John Frazee, M.D.
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Philip B. Collins, M.D.
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Thomas L. Eby, M.D.
Gregory J. Fleming, M.D.
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Richard A. Field, M.D.

Consultant in Oncology
Philip Amrein, M.D.

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C. Stephen Foster, M.D.
Stephen J. Fricker, M.D.
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Berman-Gund Laboratory for the Study of Retinal Degeneration
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Rikki Hansen, *Manager of Administration*

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Ross B. Edwards, Ph.D.
Stephen O'Gorman, Ph.D.
Michael A. Sandberg, Ph.D.
Susan Y. Schmidt, Ph.D.

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Thaddeus P. Dryja, M.D.
Britain Nicholson, M.D.
Bernard Rosner, Ph.D.
Walter Willett, M.D.

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Kenneth C. Hayes, Ph.D.
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P. John Anderson, Ph.D.
Usha Andley, Ph.D.
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Ross B. Edwards, Ph.D.
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Mark Johnson, Ph.D.
Nancy Kolodny, Ph.D.
Jack Liang, Ph.D.
Michael A. Sandberg, Ph.D.
Stanley Schein, M.D., Ph.D.
Susan Y. Schmidt, Ph.D.
Bonnie Specker, Ph.D.
Peter Wells, Ph.D.
David Wilcox, Ph.D.
Ernst G. Wolf, Ph.D.

Research Fellows in Ophthalmology
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Shinji Danjo, M.D.
Bunshu Ebato, M.D
Cynthia Heth, Ph.D.
Jin-Wei Huang, M.D.
Hermann Ludwig Kain, M.D.
Takako Kawaba, Ph.D.
Julie S. Lee, M.D.
Moon Soo Lee, M.D.
Teodosio Libondi, M.D.
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Klaus G. Riedel, M.D.
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Donald K. Eddington, Ph.D.
Ruth Anne Eatock, Ph.D.
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Robert A. Levine, M.D.
M. Charles Liberman, Ph.D.
Edmund A. Mroz, Jr., Ph.D.
William T. Peake, Sc.D.
William M. Rabinowitz, Ph.D.
John J. Rosowski, Ph.D.
David K. Ryugo, Ph.D.
William F. Sewell, Ph.D.
Thomas F. Weiss, Ph.D.

Electron Microscopy Laboratory
Robert S. Kimura, Ph.D., *Director*

Evoked Response Audiometry Laboratory
Aaron R. Thornton, Ph.D., *Director*
Joseph B. Nadol, Jr., M.D., *Clinical Director*
Barbara H. Sprague, Ph.D.

Histopathology Laboratory
Harold F. Schuknecht, M.D.

Research Fellows in Otolaryngology
Sho Hashimoto, M.D.
Sylvette Vacher, M.D.

Publications

October 1, 1983–September 30, 1984

Administration

MARGARETE ARNDT

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Department of Radiology

JAMES T. RHEA, M.D.

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ALFRED L. WEBER, M.D.

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Department of Ophthalmology Surgical and Research Staffs

MARK B. ABELSON, M.D.

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LLOYD M. AIELLO, M.D.

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DANIEL M. ALBERT, M.D.

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MATHEA R. ALLANSMITH, M.D.

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P. JOHN ANDERSON, Ph.D.

Anderson PJ (See Epstein DL, Karageuzian LN).

CLAUDIA A. ARRIGG, M.D.

Arrigg CA (See Fournier GA).

PATRICK BARNETT, B.S.

Barnett P (See Gonzalez RG).

MARIE E. BATHRICK, M.D.

Bathrick ME (See Beyer-Machule CK).

C. DAVIS BELCHER, M.D.

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Comparative Statistics

Comparative Statistics:
Fiscal 1984–1983
Massachusetts Eye and Ear Infirmary

		1984	1983
Inpatient Hospital *174 Beds*			
	Admissions:		
	Eye Patients	8,913	8,526
	ENT Patients	4,237	4,335
	Total Admissions	13,150	12,861
	Operations:		
	By Eye House Staff	831	886
	By Eye Attending Staff	7,902	7,718
	Total Eye Operations	8,733	8,604
	By ENT House Staff	716	805
	By ENT Attending Staff	3,088	3,366
	Total ENT Operations	3,804	4,171
	Total Operations	12,537	12,775
	Discharges:	13,208	12,886
	Death	8	11
	Autopsies	25%	1%
	Patient days	49,790	52,461
	Average patient census	136	144
	Average length of stay	3.79	4.08
	Bed utilization	79%	83%
Outpatient Department			
	Eye Clinic		
	Total Eye Visits	(1) 39,731	42,661
	ENT Clinic		
	Total ENT Visits	17,197	18,833
	Total OPD Visits	56,928	61,494
Emergency Ward			
	Eye cases	17,137	18,920
	ENT cases	13,589	15,219
	Total	30,726	34,139

Comparative Statistics:
Fiscal 1984–1983
Massachusetts Eye and Ear Infirmary

		1984	1983
Ambulatory Surgery			
	Eye cases	(2) 4,853	4,256
	ENT cases	(2) 2,322	2,274
	Total	7,175	6,530
Special Services			
	Audiology	11,498	11,630
	Pattern Evoked Response	1,398	1,199
	Electroretinography (tests)	926	784
	Fluorescein (tests)	3,098	2,705
	Low vision	386	284
	Neuro-ophthalmology	1,163	721
	Otoneurology (tests)	515	575
	Ultrasonography (tests)	1,540	694
	Radiology (exams)	(3) 23,955	27,219
	Laboratories		
	Eye pathology (specimens)	7,071	5,366
	ENT pathology (specimens)	5,860	5,798
	Clinical Laboratory (procedures)	129,501	118,440
	Bacteriology (cultures)	11,146	11,518

(1) General Eye Service	17,141	
Glaucoma Consultation Service	8,187	
Cornea Service	1,296	
Retina Service (includes Immunology)	4,570	
Ocular Motility Service	1,775	
Refraction Service	5,874	
Contact Lens Service	888	
	39,731	

	EYE	ENT
(2) Ambulatory Surgery	4,610	1,791
O.R. 1–18	172	241
O.R. 20	71	290
	4,853	2,322

(3) This total does not include Computerized Tomography.

Financial Statements

Massachusetts Eye and Ear Infirmary
Unrestricted Funds

Balance Sheet
September 30, 1984

Current Assets:		
Accounts Receivable	$10,836,854	
Less allowance for doubtful receivables	2,060,000	
		$8,776,854
Due from other funds		179,789
Inventories		624,908
Prepaid expenses		132,270
Estimated contractual adjustments		1,197,817
Total Current Assets		$10,911,638
Other Assets:		
Board designated assets		$2,962,427
Property, plant and equipment	$63,734,725	
Less accumulated depreciation	20,321,129	
		$43,413,596
Total other assets		$46,376,023
Total Assets		$57,287,661
Current Liabilities:		
Current installments of long-term debt		$1,251,973
Notes payable		1,670,000
Accounts payable		4,118,993
Accrued expenses		1,408,842
Due to other funds		650,825
Advance from third-party payors		591,671
Total Current Liabilities		$9,692,304
Other Liabilities and Fund Balance:		
Long-term debt, less current installments		$16,248,352
Fund Balance		31,347,005
Total Other Liabilities and Fund Balance		$47,595,357
Total Liabilities and Fund Balance		$57,287,661

Massachusetts Eye and Ear Infirmary
Restricted Funds

Balance Sheet
September 30, 1984

Assets

Specific Purpose Funds:	
Cash	$3,554,179
Investments at cost (Quoted market value: $64,412)	53,986
Due from other funds	413,188
Grants and contracts receivable	762,284
	$4,783,637
Building Fund	
Cash	$1,128,711
Total Assets	$1,128,711

Liabilities and Fund Balances

Specific Purpose Funds:	
Fund balances	
Special purpose	$4,783,637
Temporary	
Unexpended Restricted Income	
	$4,783,637
Building Fund	
Accounts payable	$ 98,118
Due to other funds	162,363
Fund balance	868,230
Total Liabilities and Fund Balances	$1,128,711

Massachusetts Eye and Ear Infirmary
Statement of Revenue and Expenses

For the Year Ending September 30, 1984

Patient Service Revenue:		$43,928,496
Adjustment to patient revenue for uncollectible accounts, free care, and contractual allowances		6,755,489
Net Patient Service Revenue:		$37,173,007
Other Operating Revenue (including $14,296,293 from research and other specific purpose funds):		17,369,978
Total Operating Revenue:		$54,542,985
Operating Expenses:		
Patient service (including depreciation)	$43,270,771	
Research and other specific purpose direct expense	14,296,293	
Total Operating Expenses		57,567,064
Loss from Operations		($3,024,079)
Non-operating revenues (net of expenses)		1,317,232
Excess of expenses over revenues		($1,706,847)

Foundation of the Massachusetts Eye and Ear Infirmary, Inc.** Restricted Funds

Balance Sheet

September 30, 1984

Assets	
Specific Purpose Funds:	
Cash	$ 3,554,179
Investments at cost (Quoted market value: $2,318,508)	2,291,748
Due from other funds	413,188
Grants and contracts receivable	762,284
	$7,021,399
Building Fund:	
Cash	1,128,711
	$1,128,711
Endowment Funds:	
Cash	$ 5,631
Investments at cost (Quoted market value: $17,203,120)	15,877,692
Due from other funds	600,000
Total Assets	$16,483,323
Liabilities and Fund Balances	
Specific Purpose Funds:	
Fund balances	
Special purpose	$ 4,783,637
Temporary	1,520,888
Unexpended Restricted Income	716,874
	$ 7,021,399
Building Fund:	
Accounts payable	$ 98,118
Due to other funds	162,363
Fund balance	868,230
	$1,128,711
Endowment Funds:	
Equity in undistributed security pool gains	$ 4,326,857
Fund balances:	
Income restricted	2,475,029
Income unrestricted	8,920,507
Quasi-endowments	760,930
Total Liabilities and Fund Balance	$16,483,323

**The Foundation of the Massachusetts Eye and Ear Infirmary, Inc. is a holding company established in 1983 for the purpose of enhancing the financial well-being of the Infirmary.

Foundation of the Massachusetts Eye and Ear Infirmary, Inc.* * Unrestricted Funds

Balance Sheet

September 30, 1984

Current Assets:		
Accounts Receivable	$10,866,645	
Less allowance for doubtful receivables	2,060,000	
		$ 8,806,645
Inventories		624,908
Prepaid Expenses		134,562
Estimated contractual adjustments		1,197,817
Total Current Assets		$10,763,932
Other Assets:		
Board designated assets		$ 5,937,620
Organizational costs (net of amortization)		13,364
Property, plant and equipment	$64,884,647	
Less accumulated depreciation	20,326,814	
		$44,557,833
Construction in Progress		3,024,683
Total other assets		$53,533,500
Total Assets		$64,297,432
Current Liabilities:		
Current installments of long-term debt		$ 1,285,492
Notes payable		1,670,000
Accounts Payable		4,100,354
Accrued Expenses		1,408,842
Due to other funds		650,825
Advance from third-party payors		591,671
Total Current Liabilities		$ 9,707,184
Other Liabilities and Fund Balance:		
Long-term debt, less current installments		$18,135,798
Construction payables		568,199
Rental deposits		27,226
Note payable to other funds		600,000
Fund Balance		35,259,025
Total Other Liabilities and Fund Balance		$54,590,248
Total Liabilities and Fund Balance		$64,297,432
Income from Investments	$3,095,488	
Gifts and Bequests	3,015,977	
Donated Income—various estates	419,070	
Total	$6,530,535	

Form of Bequest

I give _____
dollars to the Foundation of the Massachusetts Eye and Ear Infirmary, Inc., to be used for such of its purposes as may be directed by the Foundation's Board of Directors.

Joseph C. Goodman
Director of Public Affairs
Executive Editor

Regina S. Kilfoyle
Editor

Marilyn Davis Archibald
Leslie A. Dennis
Editorial Staff

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Lapham/Miller Associates, Inc.

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Bradford Herzog
John Goodman

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Massachusetts Eye and Ear Infirmary
243 Charles Street
Boston, Massachusetts 02114

Massachusetts Eye and Ear Infirmary

1985
Annual Report

In 1985 the Massachusetts Eye and Ear Infirmary developed a new institutional mark which portrays a rising sun over rolling ocean waves, representing sight and sound. These images are derived from the Infirmary's traditional seal, first used in 1827. The new mark and the traditional seal, highlighted in this report, together symbolize both the Infirmary's proud tradition and its continuing commitment to patient care, education, and research.

An important aspect of preparing
an annual report is reflecting upon our identity.
The question—who are we?—needs to be asked as often as possible,
for the identity of an institution as
complex as the Massachusetts Eye and Ear Infirmary
necessarily changes over time.

In the past year, we have redefined the Infirmary's
agenda to meet the challenges of the rapidly changing health
care environment. In fact, our ability to recognize new
opportunities and to respond to them on short notice will continue to
be a critical determinant of future success.

At the same time, we cannot afford to forget or ignore
what is enduring in our institutional character.
The Massachusetts Eye and Ear Infirmary is recognized and
appreciated for its unique history, unusual commitment to excellence,
and special medical mission. It is our hope that this annual report
will serve to remind us of that identity and
of the opportunities that await us.

Ephraim Friedman, M.D.,
President

August R. Meyer
Chairman of the Board

During the past year, members of the Infirmary community could not help but become aware of the challenges facing teaching hospitals in general and the Infirmary in particular. But no less apparent was our ability to turn the strengths inherent in our identity to advantage.

As a teaching hospital, the Infirmary has a three-dimensional mission: to provide patient care; to train physicians, nurses, and other health professionals; and to conduct medical research. The benefits derived from linking these efforts are undeniable. Patients gain immediate access to the most recent advances in medicine, while physicians are trained in a stimulating clinical environment. At the same time, researchers can interact and exchange ideas with practitioners on a daily basis.

But as a teaching hospital, we labor under the higher costs associated with treating more complex cases as well as the costs associated with maintaining outstanding training and research programs. We also accept the responsibility of delivering care to patients who are inadequately insured or unable to pay for their care.

Despite these factors and despite the nationwide decrease in hospital use, the Infirmary concluded fiscal 1985 in excellent financial health. We have done so by responding rapidly and decisively to many new challenges. We were able, for example, to establish an on-site ambulatory surgery center which is currently serving a steadily increasing number of patients. We have also responded to the need to improve our data processing technology and to staff our fiscal affairs office with skilled professionals under the direction of experienced leadership.

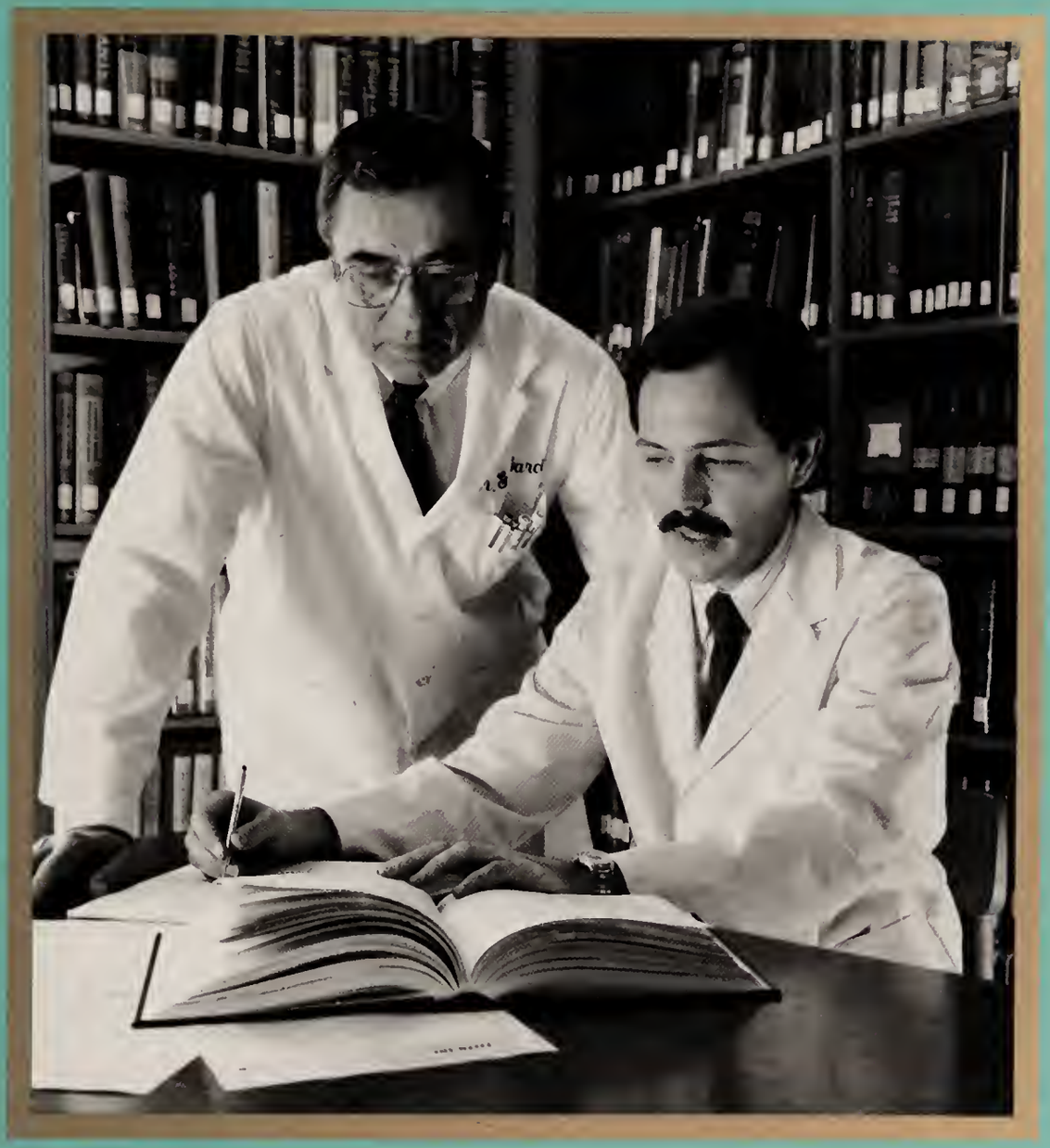
Outstanding men and women are the institution's most important resource, for it is their efforts which sustain and advance the Infirmary's mission.'

We have recognized that to achieve our multiple missions we must seek multiple means of support. Task forces comprised of trustees, physicians, and administrators have developed new policies and programs in industrial relations, marketing, and reimbursement. Our fundraising efforts, directed by James Keenan, vice president for development, have been strengthened by the addition of new professional staff as well as the creation of a trustee committee on development. We have received a significant level of philanthropic support from our medical staff, both individually and through the Service Fund Committees of the Departments of Otolaryngology and Ophthalmology, and we have benefited from the generosity of many individual and corporate donors who have supported new facilities and programs.

Outstanding Men and Women

As a teaching hospital associated with Harvard University, we continue to attract the loyalty of men and women of outstanding character, uncommon intelligence, and untiring commitment.

The past year has seen both the arrival and the departure of such people. Mr. Arthur Berarducci joined the Infirmary as executive vice president, as Mrs. Margarete Arndt, who had served the Infirmary superbly for 14 years, sought new career goals. Miss Madeline Shipsey, for 42 years the Infirmary's director of social services retired, while Evelyn "Brownie" Brewster, R.N., director of our operating rooms, also retired and passed her responsibilities into the very capable hands of Carol Covell, R.N. Among those who joined the Infirmary's administration was Ms. Susan Agan as assistant to the president.



'In the past year, despite proposed reductions in federal support for graduate medical education, we maintained internationally renowned residency and fellowship programs in both Ophthalmology and Otolaryngology.'

Within the past year, Joseph B. Nadol, Jr., M.D., began his tenure as chief of otolaryngology and, as expected, established standards of excellence in education, clinical care, and research for the department. Parviz Janfaza, M.D., joined the department to assume the important task of overseeing residency training.

The Department of Ophthalmology continued to prosper under the leadership of Claes H. Dohlman, M.D., and several new appointments were announced, including Kenneth R. Kenyon, M.D., and B. Thomas Hutchinson, M.D., as associate chiefs of ophthalmology. Evangelos S. Gragoudas, M.D., succeeded Charles D.J. Regan, M.D., as director of the Retina Service. New physicians joined both the hospital-based and non-hospital staffs in ophthalmology and otolaryngology.

Robert Hughes, M.D., became the new chief of the Infirmary Medical Unit, and Porter H. Smith, M.D., announced his plans to retire as chief of the Department of Anesthesiology.

These new staff members, as well as many others, are the institution's most important resource, for it is their efforts which sustain and advance the Infirmary's mission.

A Commitment to Medical Education and Research

In the past year, despite proposed reductions in federal support for graduate medical education, we maintained internationally renowned residency and fellowship programs in both ophthalmology and otolaryngology. There were 365 applicants

'The Infirmary enjoys an unusually strong sense of community and has a sharply defined sense of institutional purpose that will help us prosper in the increasingly competitive world of health care.'

for seven residency positions in ophthalmology for 1987; while some 150 applicants applied for the four available positions in the 1987 otolaryngology residency program.

We also embarked on an ambitious program to construct, equip, and endow a new professional library which will become the Infirmary's information center. In conjunction with this program, Ms. Joan Haas was hired to oversee the maintenance, collection, and housing of our unique archival collection of ophthalmic and otolaryngologic material. The importance of developing outstanding programs in continuing education for medical and allied health professionals was recognized with the addition of Bernice McPhee, director of Educational Services, to the Infirmary staff.

At the same time, Infirmary researchers sustained and improved upon their record as outstanding investigators. Our major laboratories—the Howe Laboratory of Ophthalmology, the Eaton-Peabody Laboratory of Auditory Physiology, and the Berman-Gund Laboratory for the Study of Retinal Degenerations—continued to be the sites of leading research in basic science and clinical technique. A new Epidemiology Center was established under the leadership of Johanna Seddon, M.D., while research activity at the recently constructed Hilles Immunology Laboratory intensified. A team of surgeons and researchers from the Cochlear Implant Project for the Rehabilitation of the Profoundly Deaf implanted five patients and planned to perform approximately twelve additional implants in the coming year.

'In the past year,
Infirmary researchers
sustained and improved upon
their record as
outstanding investigators.'

The Morse Laser Center, which incorporates research and clinical components, opened and was recognized as one of the preeminent facilities of its kind in the nation.

The Role of the Specialty Hospital

The Infirmary's identity as a Harvard teaching hospital distinguishes us from other health care institutions in defining both our challenges and our opportunities. What distinguishes us from other teaching hospitals is our commitment to a relatively specialized field of medical care.

As a specialty hospital we have been careful about our growth and selective about our focus. We enjoy an unusually strong sense of community, and have a more sharply defined sense of institutional purpose that will help us prosper in the increasingly competitive world of health care.

While we cannot afford to allow our preeminence as an eye and ear hospital to lead to complacency, we can be justifiably proud of what we have accomplished as a result of our cohesiveness.
A new publication, the *Alumni News*, produced by the Infirmary's Office of Public Affairs in cooperation with the Massachusetts Eye and Ear Infirmary's Alumni Association, reflects not only the accomplishments of those physicians who have received training here, but also demonstrates their exceptional loyalty to the institution.

The establishment of the Massachusetts Eye and Ear Infirmary Rehabilitation Center in the past year also bears eloquent testimony to the unique potential of a specialized

'What has remained unchanged in the more than a century and a half of the Infirmary's existence is our commitment to providing the finest care possible to our patients.'

institution. The center, under the direction of C. Patricia McCabe, is the only one of its kind in the country, integrating medical, social, and educational expertise to offer comprehensive care for sight and hearing impaired patients.

Of the challenges that we currently face, perhaps none is more important than the reorganization of our ambulatory services. This reorganization effort, like so many efforts at the Infirmary, has required the talents and hard work of people from all segments of the community. A committee, chaired by Dr. George Garcia and staffed by Ruth Aaron, vice president for ambulatory and ancillary services, brought together trustees, medical staff, and management to study the issue and recommend suitable models for a new Infirmary ambulatory service.

The committee's work and the contributions of many others has assured us of establishing an outstanding program for all ambulatory patients at the Infirmary. This is a significant, even historic, achievement, and there is no doubt that the new ambulatory service will reflect the Infirmary's unique identity as an exemplary teaching and specialty hospital.

The Massachusetts Eye and Ear Infirmary's identity has evolved over the century and a half of its existence, and it will continue to evolve in the decades ahead. What remains unchanged, however, is our commitment to providing the finest care possible to our patients, our acceptance of the profound responsibility of educating medical professionals, and our determination to advance scientific knowledge in ophthalmology and otolaryngology.

'A new laser center,
which incorporates both research
and clinical components,
was opened in May 1985 and
was recognized as one of the
preeminent facilities
of its kind in the nation.'

Comparative Statistics: Fiscal 1985–1984 Massachusetts Eye and Ear Infirmary

		1985	1984
Inpatient Hospital 174 Beds	**Admissions:**		
	Eye patients	6,763	8,913
	ENT patients	4,205	4,237
	Total Admissions	10,968	13,150
	Operations:		
	By Eye House Staff	488	831
	By Eye Attending Staff	6,039	7,902
	Total Eye Operations	6,527	8,733
	By ENT House Staff	732	716
	By ENT Attending Staff	2,946	3,088
	Total ENT Operations	3,678	3,804
	Total Operations	10,205	12,537
	Discharges:	10,997	13,208
	Patient days	38,680	49,790
	Average patient census	106	136
	Average length of stay	3.5	3.7
	Bed utilization	61%	79%
Outpatient Department			
	Eye Clinic		
	Total Eye Visits	(1) 42,731	39,731
	ENT Clinic		
	Total ENT Visits	17,150	17,197
	Total OPD Visits	59,881	56,928
Emergency Ward			
	Eye cases	18,769	17,137
	ENT cases	13,496	13,589
	Total	32,265	30,726
Ambulatory Surgery			
	Eye cases	(2) 7,445	4,853
	ENT cases	(2) 2,264	2,322
	Total	9,709	7,175
Special Services			
	Audiology	10,935	11,498
	Pattern Evoked Response	1,540	1,398
	Electroretinography (tests)	804	920
	Fluorescein (tests)	3,441	3,908
	Low vision	636	380
	Neuro-ophthalmology	1,161	1,162
	Otoneurology (tests)	344	513
	Ultrasonography (tests)	1,523	1,540
	Radiology (exams)	19,450	23,955
	Cat Scan	4,497	3,647
	Laboratories		
	Eye pathology (specimens)	7,106	7,071
	ENT pathology (specimens)	5,089	5,860
	Clinical Laboratory (procedures)	129,835	129,501
	Bacteriology (cultures)	10,516	11,140

(1) General Eye Service	18,846	
Glaucoma Consultation Service	7,945	
Cornea Service	1,248	
Retina Service (includes Immunology)	4,044	
Ocular Motility Service	1,600	
Refraction Service	7,344	
Contact Lens Service	1,704	
	42,731	

	EYE	ENT
(2) Ambulatory Surgery	4,684	869
O.R. 1–18	2,362	322
O.R. 20	399	1,073
	7,445	2,264

Foundation of the Massachusetts Eye and Ear Infirmary, Inc.** Unrestricted Funds

Balance Sheet
September 30, 1985

Current Assets:		
Cash		$319,237
Accounts Receivable	$13,486,074	
Less allowance for doubtful receivables	2,888,000	
		$10,598,074
Inventories		508,911
Prepaid expenses		433,253
Total Current Assets		$11,859,475
Other Assets:		
Board designated assets		$ 8,364,018
Organizational costs (net of amortization)		128,163
Property, plant and equipment	$72,310,744	
Less accumulated depreciation	23,170,649	
		$49,140,095
Construction in progress		1,576,681
Total other assets		$59,208,957
Total Assets		$71,068,432
Current Liabilities:		
Current installments of long-term debt		$ 1,484,839
Notes payable		3,720,000
Accounts payable		2,508,103
Accrued expenses		1,740,517
Due to other funds		149,409
Due to third-party payors		1,035,457
Total Current Liabilities		$10,638,325
Other Liabilities and Fund Balance:		
Long-term debt, less current installments		$21,298,036
Construction payables		575,179
Rental deposits		14,525
Note payable to other funds		600,000
Fund Balance		37,942,367
Total Other Liabilities and Fund Balance		$60,430,107
Total Liabilities and Fund Balance		$71,068,432

**The Foundation of the Massachusetts Eye and Ear Infirmary, Inc. is a holding company established in 1983 for the purpose of enhancing the financial well-being of the Infirmary.

Income from Investments	$3,034,000
Gifts and Bequests	$1,718,531
Total	$4,752,531

Massachusetts Eye and Ear Infirmary Restricted Funds

Balance Sheet
September 30, 1985

Assets	**Specific Purpose Funds:**	
	Cash and cash equivalents	$3,501,34
	Investments at cost (Quoted market value: $69,894)	53,98
	Due from other funds	201,58
	Grants and contracts receivable	601,8
	Due from affiliate	140,64
	Total	$4,499,4
	Building Fund	
	Cash and cash equivalents	$ 514,5
	Total	$ 514,5
Liabilities and Fund Balances	**Specific Purpose Funds:**	
	Fund balances	
	Special purpose	$4,499,4
	Total	$4,499,4
	Building Fund	
	Accounts payable	$ 00,0
	Due to other funds	000,0
	Fund balance	514,5
	Total	$ 514,5

Massachusetts Eye and Ear Infirmary Unrestricted Funds

Balance Sheet
September 30, 1985

	Current Assets:	
	Cash	$ 95,6
	Accounts Receivable $13,451,098	
	Less allowance for doubtful receivables 2,888,000	
		$10,563,0
	Due from other funds	296,8
	Inventories	508,9
	Prepaid expenses	427,8
	Total Current Assets	$11,892,4
	Other Assets:	
	Board designated assets	$ 5,302,2
	Property, plant and equipment $68,076,385	
	Less accumulated depreciation 23,083,711	
		$44,992,0
	Total Other Assets	$50,294,9
	Total Assets	$62,187,8
	Current Liabilities:	
	Current installments of long-term debt	$ 1,590,0
	Notes payable	3,720,0
	Accounts payable	2,381,4
	Accrued expenses	1,740,3
	Due to other funds	201,3
	Due to third-party payors	1,035,4
	Total Current Liabilities	$10,669,0
	Other Liabilities and Fund Balance:	
	Long-term debt, less current installments	$17,494,3
	Fund Balance	34,023,0
	Total Other Liabilities and Fund Balance	$51,518,3
	Total Liabilities and Fund Balance	$62,187,3

Massachusetts Eye and Ear Infirmary Statement of Revenue and Expenses

For the year ending September 30, 1985

Patient Service Revenue:		$52,082,359
Adjustment to patient revenue for uncollectible accounts, free care, and contractual allowances		10,249,583
Net Patient Service Revenue:		$41,832,776
Other Operating Revenue (including $15,619,307 from research and other specific purpose funds):		18,722,255
Total Operating Revenue:		$60,555,031
Operating Expenses:		
Patient service (including depreciation)	$44,575,843	
Research and other specific purpose direct expense	15,619,307	
Total Operating Expenses		$60,195,150
Income from Operations		$ 359,881
Non-operating revenues (net of expenses)		1,347,953
Excess of revenues over expenses		$ 1,707,834

Foundation of the Massachusetts Eye and Ear Infirmary, Inc.** Restricted Funds

Balance Sheet
September 30, 1985

Assets		
Specific Purpose Funds:		
Cash and equivalents		$ 3,501,349
Investments at cost (Quoted market value: $2,816,970)		2,779,559
Due from other funds		132,228
Grants and contracts receivable		601,837
Total		$ 7,014,973
Building Fund:		
Cash		$ 514,524
Total		$ 514,524
Endowment Funds:		
Cash		$ 000,000
Investments at cost (Quoted market value: $19,214,902)		16,778,966
Due from other funds		617,181
Total		$17,396,147
Liabilities and Fund Balances		
Specific Purpose Funds:		
Fund balances		
Special purpose		$ 4,499,402
Temporary		1,567,305
Unexpended Restricted Income		948,266
Total		$ 7,014,973
Building Fund:		
Accounts payable		$ 000,000
Due to other funds		000,000
Fund balance		514,524
Total		$ 514,524
Endowment Funds:		
Equity in undistributed security pool gains		$ 5,073,759
Fund balances:		
Income restricted		2,583,186
Income unrestricted		8,978,272
Quasi-endowments		760,930
Total		$17,396,147

**The Foundation of the Massachusetts Eye and Ear Infirmary, Inc. is a holding company established in 1983 for the purpose of enhancing the financial well-being of the Infirmary.

Department of Anesthesiology

Active Staff

Chief of Anesthesiology
Porter H. Smith, M.D.

Anesthesiologists
John V. Donlon, Jr., M.D.
Jin Woo Kim, M.D.

Associate Anesthesiologists
Malcolm J. Heslop, M.D.
Kathryn E. McGoldrick, M.D.
Janine T. Rodrigues-Saldanha, M.D.

Assistant Anesthesiologists
Bennie Geffin, M.D.
Fayette C. Root, M.D.
Lily Tabbal, M.D.

Associate Staff

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Richard J. Lofrumento, M.D.

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Judy Tsu Kuan O'Young, M.D.
Fred A. Rotenberg, M.D.

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Richard A. Field, M.D.

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Philip Amrein, M.D.

Epidemiologist and Consultant in Infectious Disease; Associate Director of Bacteriology
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Consultant in Allergy and Immunology
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William Bornstein, M.D.
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Kevan Hartshorn, M.D.
Robert Schooley, M.D.
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Luis J. Vidaurri, M.D.
Francisco Villarreal, M.D.

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The following donors provided generous gifts during fiscal year 1985 for the Infirmary's campaign for a new library and archives. We are most grateful for their support to this ongoing campaign.

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"Our response has always been to invite and embrace change."

Annual Report 1986

Massachusetts Eye and Ear Infirmary

Message from the President and the Chairman of the Board

August R. Meyer
Chairman of the Board

Ephraim Friedman, M.D.
President

The Massachusetts Eye and Ear Infirmary today operates in a fast-changing world. Each day brings new developments in the social, economic, and political context of healthcare. In many cases, the rate of change is so rapid, the nature of change so extreme, that it hardly seems possible to keep pace.

Yet, despite the difficulty of dealing with change on a daily basis, we must not only keep pace, but also anticipate what lies ahead. We must turn challenges into opportunities and ensure that there will be no interruption of patient services, no break in the training of physicians, no dissolution of research efforts.

The Infirmary has met this responsibility admirably. Our institutional response has always been to invite and embrace change. And in the process of arriving at this position, we have grown both more assertive and more certain of our mission.

A review of the past year's accomplishments reveals the effectiveness—and the necessity—of this approach. A new group practice, the Massachusetts Eye and Ear Associates, is already proving highly successful in delivering ambulatory care at the Infirmary and in contributing to our residency and fellowship programs. A new medical records department, administered by Infirmary personnel and housed in the Infirmary, is functioning smoothly. New data processing programs are in place, as is a new program to serve the emotional needs of our pediatric patients and their families. New additions to Infirmary medical and administrative staff include a new director of the Head and Neck Oncology Service (a joint appointment of the Infirmary and the Massachusetts General Hospital) and the Infirmary's first in-house attorney. A new interior design program has helped create a more attractive and comfortable environment for both patients and employees.

In the past year, we have benefited from outstanding leadership provided by our board of trustees, by our chiefs of service—Drs. Dohlman, Nadol, Smith, Ramsey, Weber, Hughes, Garcia, Hutchinson, and Kenyon—and by the Infirmary's executive vice president, Mr. Arthur Berarducci.

Undoubtedly, we will be called upon to respond to change with equal speed and creativity in the year ahead. Among the challenges we will face are extending the Infirmary's reach and influence internationally, working harmoniously with managed-care delivery systems, developing cooperative ventures with our medical staff, and establishing strong affiliations with other health-care providers, the corporate sector, and legislative leaders. In addition, we face the special challenge of sustaining and enhancing our research efforts.

A climate of intense and unrelenting change is not necessarily desirable, and for some institutions, it will prove to be unhealthy. The Infirmary is fortunate in that we can bring to bear considerable human and material resources on problems that confront us. We have already shown ourselves to be capable of responding to change without compromising our basic commitments to patient care, teaching, and research. There is no doubt that this will continue to be our hallmark in the future.

The Continuing Tradition—Research at the Massachusetts Eye and Ear Infirmary

by Regina S. Kilfoyle

"Shared information and technology means that our lab can look at the newest types of laser technology and immediately apply them to laser ophthalmology." Carmen A. Puliafito, M.D., Director, Laser Research Laboratory

Research. The word evokes images of white-coated scientists hunched over bubbling pyrex bottles. At the extreme, it is an image of loners at work in remote laboratories, absorbed in the pursuit of arcane knowledge, out of touch with everyday life.

But the reality of research is far different. At Massachusetts Eye and Ear Infirmary, researchers are dedicated to finding real solutions to real medical problems. Many are physicians who somehow manage to fulfill the enormous dual responsibilities of caring for patients and contributing to the body of medical information in their specialties. Others are Ph.D. researchers who have devoted themselves to science. They are diverse personalities who represent diverse disciplines, such as audiology, optometry, and epidemiology, or other branches of the sciences such as engineering, mathematics, and computer science. Yet all have a common goal: to make a direct impact on the daily lives of those who suffer from diseases of the eye, ear, nose, or throat.

These men and women work under great pressure; to flourish as scientists, they must find a way to cope with a wide range of problems, from competition for limited funding to waiting for months for their results to be published and recognized.

A Distinguished Investigative Tradition

But coping with—and solving—problems is the sine qua non of research. In fact, the Infirmary has a long and proud tradition of medical and scientific investigation, beginning with the creation of a post for a resident pathologist in 1900. Frederick H. Verhoeff, M.D., was named to the position, and he established the first eye pathology laboratory in the country and encouraged the creation of an endowed ophthalmic research department.

The Infirmary now houses three world-renowned research laboratories, each dedicated to the advancement of knowledge in one of the institution's specialties:

- the Eaton-Peabody Laboratory of Auditory Physiology, established in 1957 as a joint venture by the Massachusetts Eye and Ear Infirmary, Massachusetts Institute of Technology, and Harvard Medical School under the direction of Nelson Y.S. Kiang, Ph.D., has done pioneering studies on auditory function and the relationship between the ear and the brain;
- the Howe Laboratory of Ophthalmology, directed by Claes H. Dohlman, M.D., is one of the largest and most distinguished ophthalmic research laboratories in the country and conducts investigations into all aspects of eye function and disease;
- and the Berman-Gund Laboratory for the Study of Retinal Degeneration, established in 1974 by laboratory director Eliot L. Berson, M.D., examines the underlying causes of degenerative eye diseases such as retinitis pigmentosa.

Over 100 researchers staff these laboratories, studying problems that range from hearing and vision loss, cancer, and other eye and ear, nose, and throat diseases, and including the normal parameters of hearing and sight. Medical students and research fellows from nearly every major university in this country and from a host of foreign countries come to study in these laboratories, to learn from the internationally recognized senior scientists who are associated with the Infirmary's laboratories.

A Team Approach

These young physicians and researchers are attracted to an environment that offers a dynamic interaction between scientists, clinicians, and teachers. Says Johanna M. Seddon, M.D., a graduate of the Infirmary's ophthalmic fellowship program and now director of the Infirmary's Epidemiology Unit, "An academic center such as the Infirmary is the most appropriate place to conduct research. The immediate access and close contact with patients motivates researchers to investigate more thoroughly the causes and effects of disease."

In 1986, the Infirmary established a Child Life Program to better serve the emotional needs of our pediatric patients and their families.

Seddon adds, "I feel that teamwork is essential not only for the work of the Epidemiology Unit but in all research. The merging of skills and expertise from each researcher, physician, lab technician, or study coordinator all contribute to the outcome."

Seddon and other members of the Epidemiology Unit embody the team approach to research which defies the image of scientists working in isolation. The ophthalmologists, epidemiologists, biostatisticians, computer scientists, and other staff in the unit are currently involved in several studies in collaboration with other Infirmary departments and services, as well as the Harvard School of Public Health, and which involve direct contact with the Infirmary's patient population. These collaborative efforts to find out more about problems affecting large segments of the population include a study of various retinal disorders such as macular degeneration, retinal vein occlusion, and retinal detachments; the search for the cause of the life-threatening disease uveal melanoma; a study of the incidence of ocular melanoma in New England, which has helped establish methods for ascertaining the incidence of other eye diseases; the evaluation of other primary malignancies in retinoblastoma patients; a study of the incidence and risk factors of a potentially blinding eye infection, microbial keratitis, in wearers of soft contact lenses; and the effect of family intervention on visual rehabilitation.

Leading the Way in Laser Research

Infirmary investigators frequently reach beyond the confines of the Massachusetts Eye and Ear Infirmary to work with investigators from other distinguished research institutions in the Boston area. An example of such a cooperative effort is the research taking place in the Infirmary's Morse Laser Center.

The Morse Laser Center has perhaps the most extensive collection of clinical and research laser equipment of any ophthalmic facility in

the country. Yet laser researchers here place the highest value on a well-developed collaborative relationship with neighboring Massachusetts General Hospital and Massachusetts Institute of Technology.

As Carmen A. Puliafito, M.D., director of laser research, explains, "Shared information and technology means that our lab can look at the newest types of laser technology and immediately apply them to laser ophthalmology. Laser technology in general is a young but rapidly growing field and, from its beginnings, ophthalmology has played a leading role in applying laser technology to medicine."

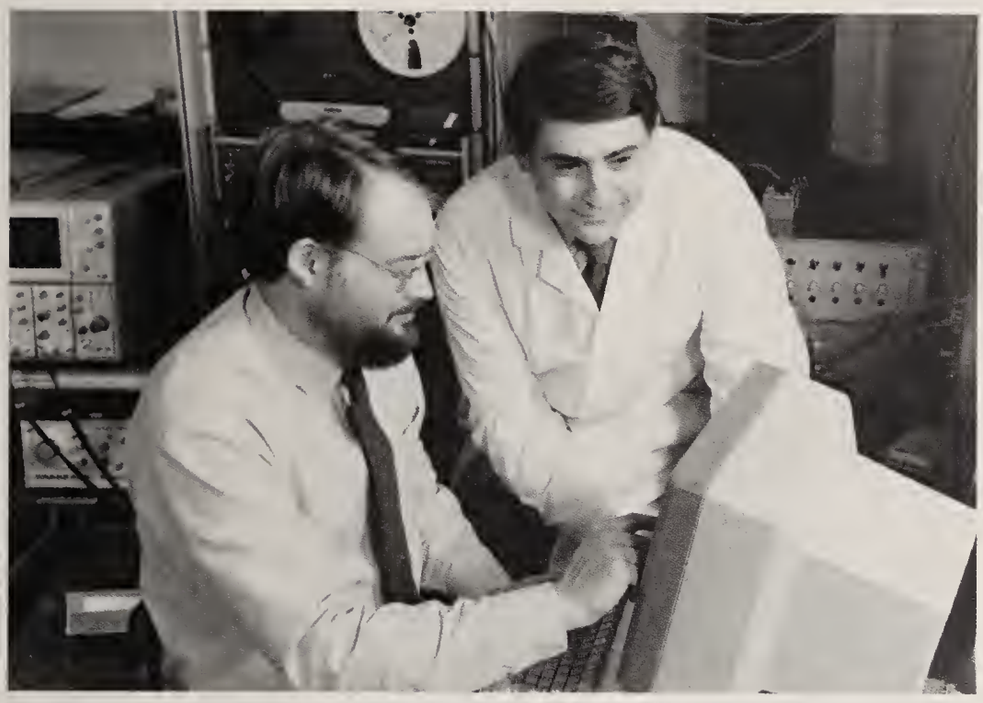
Researchers in the Morse Laser Center are currently looking into uses of the miniature semiconductor laser for retinal photocoagulation, or, sealing off leaking blood vessels in the eye common in such diseases as diabetes. They are also exploring uses of the excimer, or ultraviolet, laser for performing precise laser microsurgery Formerly used in scientific and industrial settings, the excimer laser holds exciting possibilities for use in ophthalmic surgery. Puliafito predicts that within three to five years, techniques will be developed which will enable physicians to use new lasers for corneal and retinal surgery.

"Here at the Infirmary there is no shortage of ideas, hopes, and aspirations for research projects. A research endowment would allow us to fund pilot projects, high risk projects, and start-up projects that could later become competitive for federal funding."
Joseph B. Nadol, Jr., M.D., Chief of Otolaryngology

From his laboratory on the twelfth floor, Puliafito points across the hall to the clinical side of the laser center where patients are awaiting laser treatment. "The Infirmary has the ideal situation for research into medical uses of laser," he says. "Our researchers work literally across the hall from the setting where laser technology is applied to patients' needs every day. Here, our clinical needs inspire our research efforts. As with any research, our work in the laser center entails a great deal of experimental work—you experiment and then you apply. Yet at the Infirmary we are able to initiate the research in laser techniques and then follow through with proven applications within the context of a single facility."

A Research Endowment

According to Director of Research Administration John Slymon, the Laser Research Laboratory is also a good example of research which enjoys broad-based support. Diverse financial sources such as industry, private philanthropy, National Institutes of Health (N.I.H.) and other federal granting agencies, along with sub-contracts from other research institutions all contribute to the Laser Research Laboratory at the Infirmary. Slymon is anxious to explore similar diversified support for other areas of research at the Infirmary while maintaining our strong record of support from federal sources, especially N.I.H. In a report published last year, the Infirmary was ranked eleventh among U.S. hospitals receiving research dollars from N.I.H. Our research awards have grown by an estimated 40% in the past five years to stand at $7.1 million annually, although this pattern of growth was set back by a 1986 budget cut of 10% for most N.I.H. grants. The Infirmary has had a secure base of federal support for its research thus far, but fierce competition for



A multi-disciplined team of scientists and clinicians, including otolaryngologists, neurophysiologists, psychophysicists, audiologists and psychologists, among others, contribute to the cochlear implant research program. *Left,* Donald K. Eddington, Ph.D., Director of the Cochlear Implant Research Laboratory; *right,* Joseph B. Nadol, Jr., M.D., Chief of Otolaryngology.

N.I.H. grants and fluctuations in federal budgeting for N.I.H. make dependence on federal funding a risk for even a well-established research program. Slymon is convinced that many potential sources of research revenue remain to be explored and has worked creatively with investigators to explore new resources and plan strategies for grant proposals to attract research dollars.

Chief of Otolaryngology Joseph B. Nadol, Jr., M.D., shares Slymon's desire to encourage broad-based support for Infirmary research programs. Specifically, Nadol would like to see support for an expanded research endowment program for the Department of Otolaryngology and for the entire institution. He explains, "Here at the Infirmary there is no shortage of ideas, hopes, and aspirations for research projects. A research endowment would allow us to fund pilot projects, high risk projects, and start-up projects that could later become competitive for federal funding. We could also use this as seed money for projects for young investigators just starting their research careers."

Nadol describes a project which he believes could benefit from such an expanded endowment: a laryngeal physiology laboratory to investigate the physiology of the normal and pathological larynx. "Preliminary research is already being done in such areas as vocal cord paralysis and the physiology of speech mechanisms," says Nadol. "The development of a laboratory to explore this subject would have tremendous implications for otolaryngology and the Infirmary as a whole. We already have ongoing research projects on vision and hearing —a lab for speech production would complete the communications loop."

In the meanwhile, he believes that one of the most significant research developments in his department within the past eighteen months has been the successful acquisition of an N.I.H. grant for the cochlear implant research project. A cochlear implant is a device which electrically stimulates the auditory nerve fibers to restore the perception of sound in deaf individuals. This five-year, $3.5 million grant shared between the Massachusetts Eye and Ear Infirmary and the Massachusetts Institute of Technology will allow more candidates to receive cochlear implants and will support investigators who are working in laboratories and with implanted patients to study the effects of the implant on hearing and speech.

That The Deaf May Hear

Director of the Cochlear Implant Research Laboratory Donald K. Eddington, Ph.D., quietly states that his team is very pleased with the results of the first two years of work on the cochlear implant project. "We have one patient who, even without lipreading, can basically carry on a conversation. Others have not attained this level of sound discrimination, but all of them, with lipreading plus their cochlear implant, are operating at a 95% to 100% level for speech communication."

"Clearly, the results tell us we're on the right track and that people can gain a great deal from this device," says Eddington. "But we need to quantify the results precisely to determine what we're doing properly and where we can improve the device. In the past, efforts to improve the implant have included a lot of guesswork. Our efforts are directed toward the development of an underlying framework of understanding that will provide a rational basis to guide research in this area."

While Eddington directs the research efforts of the cochlear implant project, a multi-disciplined team of basic scientists and clinicians, including neurophysiologists, psychophysicists, audiologists, and psychologists, among others, contribute to the program. "Although there are other people doing work on implants, the Infirmary/MIT program is one of the premier basic science research groups in this field," states Eddington. "Plus the Infirmary provides an important infrastructure to support the patients involved in the study. Services as diverse as diagnostic audiology and the personal and familial counselling provided by our social services are key ingredients to a program of high quality."

The success of the implants thus far has encouraged the Department of Otolaryngology to plan a clinical implant program to parallel the research program. This clinical program will make the implant available to a larger number of deaf patients far sooner than the researchers had thought possible when the program started just two years ago.

Executive Vice President Arthur A. Berarducci characterized fiscal year 1986 as a period of challenge and achievement at the Infirmary. Improved management and fiscal practices were introduced and important new patient services were developed.

Eddington's pleasure in helping his patients live fuller lives with the help of their cochlear implants is evident as he recounts the story of one of the patients in the implant program: "This man is an artisan—a furniture designer and craftsman. Before he received his implant he worked alone in his shop. But with his cochlear implant, his improved communication abilities have enabled him to join the faculty of a design school. While we as scientists derive great pleasure from adding to our understanding through the work that we do, we are especially fortunate to be involved in this project—one in which we can also share in the success of the patients we work with."

A Cancer Research Breakthrough

The most significant research development for the Department of Ophthalmology for this year, and perhaps in its history, occurred when a team of researchers led by Thaddeus P. Dryja, M.D., of the Howe Laboratory, and Stephen

Friend, M.D., Ph.D., of Dr. Robert Weinberg's laboratory at the Whitehead Institute, reported in October that they had cloned the gene governing the cancer retinoblastoma.

Retinoblastoma is an eye tumor in infants and children which frequently leads to loss of vision or removal of an eye. A relatively rare cancer (some 200 cases are reported annually in this country), retinoblastoma is the most common malignant eye tumor in children, and it is generally fatal if the tumor spreads beyond the eye. More importantly, retinoblastoma is thought to be typical of one of two known classes of cancer-causing genes, and the isolation of the retinoblastoma gene significantly advances the understanding of this group of cancers. Examples of other related cancers include certain types of kidney tumors such as Wilms' tumor, a common type of lung cancer, as well as some bone tumors.

Their discovery also carries major implications for the clinical treatment of retinoblastoma. Dryja expects that within a year patients will be able to discover if they carry the gene by means of a simple blood test. This test will allow for earlier, vision-saving diagnosis of retinoblastoma in infants and for prenatal counselling for couples with a family history of retinoblastoma.

Dryja believes that more research on genetic and degenerative ophthalmic diseases is vital, and would like to see more recruitment of molecular biologists and geneticists here at the Infirmary to carry out this work.

"During this century, great strides have been made in the treatment of trauma and infectious disease," he says. "Surgical breakthroughs and the introduction of antibiotics have saved vision in previously untreatable cases. But we still have a lot to learn in two remaining broad categories of diseases—hereditary and degenerative diseases. Retinoblastoma and retinitis pigmentosa are two examples of hereditary diseases which are ripe for study with the recombinant DNA techniques." Dryja points out that another degenerative eye disease, macular degeneration, is now the leading cause of legal blindness in this country. Occasionally, certain rare types of macular degeneration also seem to run in families.

"We have a lot more research in front of us before we can arrest or cure these sorts of blinding diseases, but the tools needed for this research are now available," Dryja says. "I would like to see the Infirmary taking the lead in research in this area."

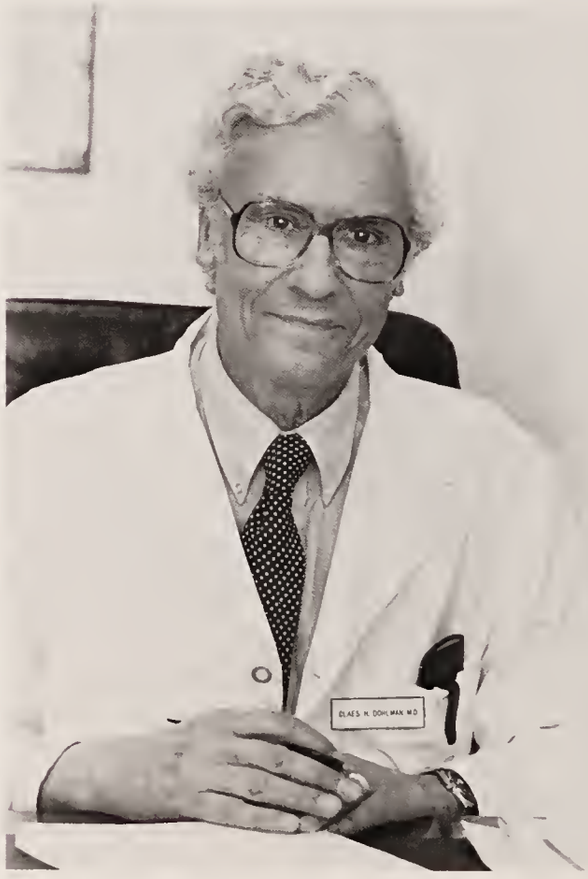
A major breakthrough in cancer research occurred when a team of researchers led by Thaddeus P. Dryja, M.D., of the Howe Laboratory, and Stephen Friend, M.D., Ph.D., of the Whitehead Institute, reported in October that they had cloned the gene governing the cancer retinoblastoma.

The Continuing Tradition

In a 1951 letter to Infirmary pathologist and researcher Frederick H. Verhoeff, M.D., (1874–1968) which is housed in the Infirmary's archives, renowned ophthalmologist Jonas S. Friedenwald, M.D., (1897–1955) wrote, "...I learned from you that truth in the raw experiment with all its doubts and contingencies is more exciting than all the simplicities of bookish authority." To this day, Infirmary researchers continue to find reward in the challenges and achievements of scientific investigation.

■ Claes H. Dohlman, M.D., chief of ophthalmology at the Infirmary and chairman of the Harvard Medical School Department of Ophthalmology since 1974, announced plans to retire in 1987. An internationally acclaimed specialist in cornea and external disease, Dohlman joined the staffs of the Infirmary and Harvard Medical School in 1958. He directed the Infirmary's Cornea Service from 1964 to 1978 and has made many significant contributions to the understanding and treatment of diseases of the cornea. Dohlman will continue as professor of ophthalmology and active staff member.

■ An ambitious restructuring of ambulatory services at the Infirmary was undertaken in 1986. A single clinical entity called the Massachusetts Eye and Ear Associates merged the Infirmary's clinics and private practices. The reorganization transformed the Infirmary's outpatient services into physician-directed group practices. The Massachusetts Eye and Ear Associates is comprised of five departments —ophthalmology, otolaryngology, anesthesiology, radiology, and medicine, and incorporates subspecialty services. Members of both the hospital-based and non-hospital-based staffs participate in the Massachusetts Eye and Ear Associates, which has enhanced the level of care for patients at the Infirmary and strengthened the Infirmary's residency training program.



During the past year, Chief of Ophthalmology Claes H. Dohlman, M.D., announced his plans to retire in 1987. A member of the Infirmary's medical staff since 1958, Dohlman has served as Chief of Ophthalmology at the Massachusetts Eye and Ear Infirmary and Chairman of the Department of Ophthalmology at Harvard Medical School since 1974.

■ Twelve new residents from across the nation began specialty studies at the Infirmary on July 1. Four of the new residents entered the four-year program in otolaryngology while eight entered the three-year program in ophthalmology. One third of the new residents are women. The Infirmary training programs continue to attract a large field of applicants from the most respected institutions in the country. This past year 337 physicians applied for eight 1988 residencies in ophthalmology and 170 physicians applied for four residencies in otolaryngology.

■ Infirmary inpatient and ambulatory admissions to the Infirmary totaled 15,256 in fiscal year 1986, 132 more than last year's figure. The total volume of ambulatory visits was 129,824, some 6,934 visits over fiscal year 1985.

■ Several Infirmary initiatives in cost management generated major savings in fiscal year 1986. An example is the Maintenance Department's savings of $250,000 in utility expenses following the introduction of a new energy management system. The Infirmary also produced an annual savings of over $300,000 in the purchase of intraocular lenses. The Infirmary accomplished this by helping to establish a nationwide purchasing consortium with other eye and ear hospitals.

■ The Infirmary Board of Trustees was strengthened significantly in 1986 with the addition of twenty one trustees. Joining the Infirmary this past year from the worlds of business, law, government, medicine, and education

were Henry Allen, M.D., George Berkowitz, Alexander Bernhard, Karen Chandor, Michael Christian, Thomas M. Claflin, II, James S. Cook, John Dowling, M.D., Ph.D., W. Morton Grant, M.D., Matina S. Horner, Diane E. Kaneb, Brendan D. Leahey, M.D., John J. Lynch, Peter Lynch, Ira Millstein, Frank A. Morse, Lt. Gen. Robert Nichols, U.S.M.C. (Ret), Ann Ehrlich Rosenfeld, Daniel Rothenburg, Harold F. Schuknecht, M.D., Malcolm L. Sherman, and Jean Smith.

■ The foundation of the Massachusetts Eye and Ear Infirmary, Inc., received $2,117,726 in new gifts this past year as compared to $1,442,281 in gifts the prior year, a 32 percent increase.

■ Appointments to the Infirmary's medical staff in 1986 included Frederic M. Ramsey, M.D., as chief of the Anesthesia Department. Previously, he was associate professor of anesthesiology at Bowman Gray School of Medicine, Winston-Salem, North Carolina. Ramsey replaced Porter Smith, M.D., who is preparing to return to medical missionary work. Richard L. Fabian, M.D., was appointed director of the joint Head and Neck Oncology Service at the Infirmary and Massachusetts General Hospital. Fabian will also continue as director of the Plastic and Reconstructive Surgery Service at the Infirmary. In addition, Dr. Conrad Wall, III, of Pittsburgh was appointed director of the new Clinical Vestibular Diagnostic Laboratory for evaluation of balance disorders at the Infirmary. The existing smaller vestibular facility at Massachusetts General Hospital will be transferred to this new service.

■ During 1986, the Massachusetts Eye and Ear Infirmary was mentioned numerous times in the local, national, and international news media. Front-page coverage in *The New York Times* of a major breakthrough in cancer research at the Infirmary, and two live broadcasts from the Infirmary on WBZ-TV's "Live on Four" are a few examples of Infirmary media coverage in 1986. In addition, Massachusetts Eye and Ear Infirmary's *Physicians Report,* a medical information column mailed monthly to 400 publications throughout New England, reached some 900,000 readers last year. From the *Wall Street Journal* to the British Broadcasting Corporation to the Pecos, Texas, *Enterprise,* the Massachusetts Eye and Ear Infirmary was recognized again in 1986 as an international center for treatment and research.

■ Over the past year construction and refurbishment of the Infirmary's physical plant was a major priority. A new interior design renovation program included new paint, carpet, ceilings, colors, and signage. Other construction projects include The John Jeffries House, formerly the Infirmary Nurses' Residence, which underwent extensive renovations. The John Jeffries House now provides moderately-priced accommodations for Infirmary patients, their families, and for visiting physicians and researchers.

■ The third-floor Massachusetts Eye and Ear Infirmary Library complex which includes the Lucien Howe Library of Ophthalmology, the LeRoy Schall Library of Otolaryngology, and the Abraham Pollen Archives, was completed. Occupying 3,300 square feet, the new library features a microfiche/microfilm room, computer and audiovisual rooms, computerized card catalogue, several computerized search systems, as well as a slide and tape library. The archives, a 1062 square-foot facility adjacent to the library, is temperature and humidity controlled to help preserve the scores of stored patient records, meeting minutes, photographs, and collections of historical medical equipment.

■ The Infirmary also established a new full service medical records department in 1986. Timed to coincide with the formation of Massachusetts Eye and Ear Associates, the establishment of the new medical records department ends the Infirmary's reliance on Massachusetts General Hospital's record system. Directed by Deborah Day Oliver, the new department is expected to oversee the opening of 130,000 new medical records in 1987.

■ 1986 was a year of advancement for the Infirmary's pediatric programs. Child Life Specialist Carol Brandt developed new literature and preoperative tours for pediatric patients and their families to help ease the fear and stress which can accompany hospitalization. Led by child life interns, the successful preoperative tours give children a chance to see the Infirmary, including the operating and recovery rooms.

■ Throughout 1986, the Infirmary Department of Human Resources devoted time and attention to the recruitment and retention of Infirmary staff. Departmental activities included developing expanded employee benefits programs and recruitment open houses. In addition, nearly 200 employees and volunteers were honored at the 1986 Service Awards ceremonies.

On May 17, 1986, the Second Annual Eye Residents' Skits provided an evening of irreverent entertainment, song, and dance to a sold-out audience in the Meltzer Auditorium.

■ New members of the Infirmary's administration in 1986 include: A. Joseph Castellana, vice president for support services; Patrick Capobianco, vice president for finance; Martha R.A. Fields, vice president for human resources; and Barbara F. Katz, general counsel.

■ Almost 350 graduates of the Infirmary's training programs gathered in April for a successful annual meeting of the M.E.E.I. Alumni Association. A full day of scientific and clinical presentations for both eye and ear, nose, and throat alumni was followed by a social gathering held at the Infirmary. *Alumni News,* the alumni association publication, continues to grow as more and more Infirmary alumni from around the world send their news and notes.

■ This past year, the Infirmary extended its continuing education courses for physicians and allied health professionals. Drawing primarily from the Infirmary staff for faculty, the courses offer a mixture of traditional and nontraditional topics, including pediatric otolaryngology, ophthalmology for the non-ophthalmic physician and internal medicine for ophthalmologists.

■ In July of 1986, the Infirmary began distributing a new patient satisfaction questionnarie to all inpatient and ambulatory admissions. The questionnaire asks patients to rate a variety of services at the Infirmary including admitting, nursing, the emergency ward, operating and recovery rooms, clinical laboratory, radiology, dietary, and the business office. The Infirmary received outstanding reviews as 209 out of 235 patients believe they received excellent care from the Infirmary health care team. Typical of the comments of the respondents was the following: "I was very impressed by the efficiency, competence, and general caring attitude that all members of the staff exhibited to me."

Comparative Statistics: Fiscal 1986–1985 Massachusetts Eye and Ear Infirmary

			1986	1985
Inpatient Hospital 174 Beds	Admissions:			
	Eye Patients		5743	6763
	ENT Patients		3977	4205
	Total Admissions		9720	10968
	Operations:			
	By Eye House Staff		341	488
	By Eye Attending Staff		5071	6039
	Total Eye Operations		5412	6527
	By ENT House Staff		668	732
	By ENT Attending Staff		2749	2946
	Total ENT Operations		3417	3678
	Total Operations		8829	10205
	Discharges:		9676	10997
	Patient days		33771	38680
	Average patient census		93	106
	Average length of stay		3.49	3.50
	Bed utilization		53%	61%
Outpatient Department				
	Eye Clinic			
	Total Eye Visits	(1)	43833	42731
	ENT Clinic			
	Total ENT Visits		16713	17150
	Total OPD Visits		60546	59881
Emergency Ward				
	Eye cases		19886	18769
	ENT cases		14724	13496
	Total		34610	32265
Ambulatory Surgery				
	Eye cases	(2)	9095	7445
	ENT cases	(2)	2332	2264
	Total		11427	9709
Special Services				
	Audiology		11361	10935
	Pattern Evoked Response		1610	1540
	Electroretinography (tests)		878	804
	Fluorescein (tests)		4127	3441
	Low Vision		738	636
	Neuro-ophthalmology		1468	1161
	Otoneurology (tests)		371	344
	Ultrasonography (tests)		1779	1523
	Radiology (exams)		18180	19450
	CT Scan		4720	4497
	Laboratories			
	Eye Pathology (specimens)		8395	7106
	ENT Pathology (specimens)		5343	5089
	Clinical Laboratory (procedures)		141384	129835
	Bacteriology (cultures)		10142	10516
	(1) General Eye Service		19374	
	Glaucoma		7646	
	Cornea Service		971	
	Retina Service (includes Immunology)		4119	
	Ocular Motility Service		1577	
	Refraction Service		7746	
	Contact Lens Service		1358	
	Eye Pediatric		824	
	Eye Plastic		218	
			43833	
			EYE	ENT
	(2) Ambulatory Surgery		5078	813
	O.R. 1–18		3506	442
	O.R. 20		511	1077
			9095	2332

Foundation of the Massachusetts Eye and Ear Infirmary, Inc.*

Unrestricted Funds

Balance Sheet
September 30, 1986

Current Assets:		
Cash		$ 1,750,652
Accounts receivable	$16,626,751	
Less allowance for doubtful receivables	2,765,000	
		$13,861,751
Inventories		365,364
Prepaid expenses		721,211
Due from donor-restricted funds		459,514
Total Current Assets		$17,158,492
Other Assets:		
Board designated assets		$ 8,912,757
Organizational costs (Net of amortization)		399,417
Property, plant and equipment	$76,245,042	
Less accumulated depreciation	26,149,062	
		$50,095,980
Construction in progress		3,883,497
Total Other Assets		$63,291,651
Total Assets		$80,450,143
Current Liabilities:		
Current installments of long-term debt		$2,596,158
Notes payable		—
Accounts payable		3,079,904
Accrued expenses		1,724,576
Due to other funds		—
Due to third-party payors		2,838,180
Deferred revenue		2,602,351
Total Current Liabilities		$12,841,169
Other Liabilities and Fund Balance:		
Long-term debt, less current installments		$26,726,921
Construction payables		383,310
Rental deposits		26,967
Note payable to other funds		600,000
Estimated Medicare waiver liability		363,824
Fund Balance		39,507,952
Total Other Liabilities and Fund Balance		$67,608,974
Total Liabilities and Fund Balance		$80,450,143

** The Foundation of the Massachusetts Eye and Ear Infirmary, Inc., is a holding company established in 1983 for the purpose of enhancing the financial well-being of the Infirmary.

Restricted Funds

Balance Sheet
September 30, 1986

Assets	**Specific Purpose Funds:**	
	Cash and equivalents	$ 4,068,629
	Investments at cost	
	(Quoted market value: $3,900,978)	3,800,624
	Due from other funds	—
	Grants and contracts receivable	864,133
	Total	$ 8,733,386
	Building Fund:	
	Cash	$ 659,582
	Total	$ 659,582
	Endowment Funds:	
	Cash	$ 0
	Investments at cost	
	(Quoted market value: $23,486,664)	21,710,964
	Due from other funds	600,000
	Total	$22,310,964
Liabilities and Fund Balances		
	Specific Purpose Funds:	
	Accounts payable	$ 892
	Due to other funds	430,784
	Fund balances:	
	Special purpose	4,738,513
	Temporary	2,339,605
	Unexpended restricted income	1,223,592
	Total	$ 8,733,386
	Building Fund:	
	Fund balance	659,582
	Total	$ 659,582
	Endowment Funds:	
	Due to general fund	$ 28,730
	Equity in undistributed security pool gains	5,079,568
	Fund balances:	
	Income restricted	3,752,009
	Income unrestricted	11,811,621
	Quasi-endowments	1,639,036
	Total	$22,310,964

Statement of Revenue and Expenses

For the year ending September 30, 1986

Patient Service Revenue:		$55,862,531
Adjustment to patient revenue for uncollectable accounts, free care, and contractual allowances		12,379,517
Net Patient Service Revenue:		$43,483,014
Other Operating Revenue (Including $16,601,396 from research and other specific purpose funds):		20,375,601
Total Operating Revenue:		$63,858,615
Operating Expenses:		
Patient service (including depreciation)	$46,689,069	
Research and other specific purpose direct expense	16,601,396	
Total Operating Expenses		$63,290,465
Income from Operations		$ 568,150
Non-operating revenues (net of expenses)		751,574
Excess of Revenues over Expenses		$ 1,319,724

Department of Anesthesiology

Active Staff

Chief of Anesthesiology
Porter H. Smith, M.D. (through 8/4/86)
Frederic M. Ramsey, M.D. (8/4/86–present)

Anesthesiologists
John V. Donlon, Jr., M.D.
Jin W. Kim, M.D.

Associate Anesthesiologists
Malcolm J. Heslop, M.D.
Kathryn E. McGoldrick, M.D.
Janine T. Rodrigues-Saldanha, M.D.
Fayette C. Root, M.D.

Assistant Anesthesiologists
Bennie Geffin, M.D.
James B. Seder, M.D.
Lily G. Tabbal, M.D.

Associate Staff

Assistants in Anesthesiology (part-time)
Theodore E. Dushane, M.D.
Randall S. Hickle, M.D.
Vincent L. Hoellerich, M.D.
Joshua P. Prager, M.D.
Jasvir S. Sandu, M.D.

Medical Unit

Chief of Medical Unit
Robert A. Hughes, M.D.

Philip Amrein, M.D.
Ann Baker, M.D.
Michael Barry, M.D.
Karen Carlson, M.D.
Paul Casale, M.D.
Gerald Doyle, M.D.
Kim Eagle, M.D.
Carol Ehrlich, M.D.
Richard Field, M.D.
Joel Finkelstein, M.D.
Carol Garner, M.D.
Alexandra Gibas, M.D.
John Goodson, M.D.
Mark Iannini, M.D.
Joseph Jacobson, M.D.
Kathleen Jennison, M.D.
Ruth Liberfarb, M.D.
Richard Moscicki, M.D.
Albert Mulley, M.D.
Britain Nicholson, M.D.
Richard Pingree, M.D.
James Richter, M.D.
Paul Skolnick, M.D.
Bruce Walker, M.D.
Margaret Wierman, M.D.
William Wojno, M.D.
Johnson Wong, M.D.

Department of Ophthalmology

Active Staff

Chief of Ophthalmology
Claes H. Dohlman, M.D.

Associate Chiefs of Ophthalmology
George E. Garcia, M.D.
B. Thomas Hutchinson, M.D.
Kenneth R. Kenyon, M.D.

Assistant Chief of Ophthalmology
Frank G. Berson, M.D.

Surgeons in Ophthalmology
Daniel M. Albert, M.D.
A. Robert Bellows, M.D.
Eliot L. Berson, M.D.
Charles K. Beyer, M.D.
S. Arthur Boruchoff, M.D.
Robert J. Brockhurst, M.D.
Richard B. Chapman, M.D.
Claes H. Dohlman, M.D.
H. MacKenzie Freeman, M.D.
Albert R. Frederick, Jr., M.D.
Stephen J. Fricker, M.D.
Ephraim Friedman, M.D.
George E. Garcia, M.D.
John R. Gehring, M.D.
Robert A. Gorn, M.D.
B. Thomas Hutchinson, M.D.
Joseph C. Kim, M.D.
Byron S. Lingeman, M.D.
J. Wallace McMeel, M.D.
George Olive, M.D.
Deborah Pavan-Langston, M.D.
Ronald C. Pruett, M.D.
Charles D. J. Regan, M.D.
Perry Rosenthal, M.D.
Alfred W. Scott, M.D.
David H. Scott, M.D.
Richard J. Simmons, M.D.
Silvio R. von Pirquet, M.D.

Associate Surgeons in Ophthalmology
Lloyd M. Aiello, M.D.
Ann Bajart, M.D.
Frank Berson, M.D.
Don C. Bienfang, M.D.
Jack F. Bowers, M.D.
John M. Carroll, M.D.
Leo T. Chylack, Jr., M.D.
Richard L. Dallow, M.D.
David L. Epstein, M.D.
Eliot M. Finkelstein, M.D.
Richard P. Floyd, M.D.
C. Stephen Foster, M.D.
Evangelos S. Gragoudas, M.D.
Arthur S. Grove, M.D.
Ralph H. Hinckley, M.D.
Roland E. Houle, M.D.
Tatsuo Hirose, M.D.
Kenneth R. Kenyon, M.D.
Mohandas M. Kini, M.D.
Joel A. Kraut, M.D.
James R. Lee, M.D.
Simmons Lessell, M.D.
Eeva-Liisa Martola, M.D.
Baruch J. Sachs, M.D.
John G. Sebestyen, M.D.
Harvey H. Slansky, M.D.
Felipe I. Tolentino, M.D.
Paul F. Vinger, M.D.
David S. Walton, M.D.
Michael S. Wiedman, M.D.
Donald R. Weis, M.D.
Johan Zwaan, M.D.

Assistant Surgeons in Ophthalmology
Mark B. Abelson, M.D.
Charles D. Belcher, III, M.D.
Chester R. Boulris, M.D.
Sheldon Buzney, M.D.
Eugene C. Ciccarelli, M.D.
Stephen Cobb, M.D.
Donald J. D'Amico, M.D.
Thaddeus P. Dryja, M.D.
Anthony J. Fraioli, M.D.
David Z. Greenseid, M.D.
David S. Hutchison, M.D.
Eric H. Johnson,M.D.
Jay H. Kaufman, M.D.
Arnold J. Kroll, M.D.
Brent W. Lambert, M.D.
Ernst Meyer, M.D.
Joseph Michon, Jr., M.D.
David Miller, M.D.
Peter B. Mooney, M.D.
Edward B. Murphy, Jr., M.D.
David G. Perkins, M.D.
Donald W. Putnoi, M.D.
Leon Remis, M.D.
James Rosenberg, M.D.
Johanna Seddon, M.D.
Bradford Shingleton, M.D.
Kenneth A. Stampfer, M.D.
Roger F. Steinert, M.D.
Daniel W. Tolpin, M.D.
David M. Tracy, M.D.
Clement Trempe, M.D.
John Weiter, M.D.

Assistants in Ophthalmology
Maida P. Antigua, M.D.
Claudia Arrigg, M.D.
Gary E. Borodic, M.D.
Michael J. Bradbury, M.D.
Romeo Chang, M.D.
John B. Constantine, M.D.
Stephen R. Deppermann, M.D.
Kweku N. Ghartey, M.D.
Edward F. Goodman, M.D.
Philip J. Harris, M.D.
Barry H. Jacobs, M.D.
Robert T. Lacy, M.D.
Raymond R. Liggio, M.D.
John I. Loewenstein, M.D.
Peter L. Lou, M.D.
Richard M. Low, M.D.
Howard Marton, M.D.
James T. Patten, M.D.
Michael Pinnolis, M.D.
Carmen Puliafito, M.D.
Theodore J. Renna, M.D.
Thomas M. Richardson, M.D.
Claudia U. Richter, M.D.
Edward A. Ryan, M.D.
Delia N. Sang, M.D.
Caldwell Smith, M.D.
Francis Sutula, M.D.
John V. Thomas, M.D.
Trexler Topping, M.D.
George M. Violin, M.D.
Safa F. Wagdi, M.D.
Michael Wagoner, M.D.
Paul Wasson, M.D.

Senior Consulting Surgeon in Ophthalmology
Robert Lawler, M.D.

Associate Staff

Assistants in Ophthalmology
Frederick Armbruster, M.D.
Joseph Burke, M.D.
Miriam Dougherty, M.D.
Richard Feit, M.D.
Edward Feldman, M.D.
David Gendelman, M.D.
George Ghareeb, M.D.
Jeffrey Gilbard, M.D.
Robert Gross, M.D.
Paul Gunderson, M.D.
Peter Hersh, M.D.
Alex Jalkh, M.D.
Judith Johnson, M.D.
Shalom Kieval, M.D.
Mark Latina, M.D.
Michael Loebl, M.D.
Jane Lubin, M.D.
James Martone, M.D.
Mary Jane McCarron, M.D.
Shelley McKee, M.D.
E. Mitchel Opremcak, M.D.
Joseph Rizzo, M.D.
Lois Smith, M.D.
Daniel Townsend, M.D.
Susan Wong, M.D.
John Woog, M.D.
Stephen Youngwirth, M.D.

Honorary Staff

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W. Morton Grant, M.D.

Associate Surgeons in Ophthalmology
Frederick Breed, M.D.
Carl G. Freese, M.D.
John M. Hill, M.D.
Robert A. Petersen, M.D.

Assistant Surgeons in Ophthalmology
Julian F. Chisholm, M.D.
Alexander Gaudio, M.D.
Robert Kinder, M.D.
Arthur Morrissey, M.D.
Bertha Offenbach, M.D.
Richard M. Robb, M.D.

Assistants in Ophthalmology
Robin Cook, M.D.
David A. Hill, M.D.

Senior Consulting Surgeons in Ophthalmology
Warren Haley, M.D.
Irving Pavlo, M.D.

Consulting Staff

Consulting Chiefs in Ophthalmology
Henry F. Allen, M.D.
Paul A. Chandler, M.D.*
David G. Cogan, M.D.

Senior Consulting Surgeons in Ophthalmology
D. Robert Alpert,M.D.
Harry E. Braconier, M.D.
David D. Donaldson, M.D.
Mahlon T. Easton, M.D.
Trygve Gundersen, M.D.*
Carl C. Johnson, M.D.
Brendan D. Leahey, M.D.
Sumner D. Liebman, M.D.
Henry A. Mosher, M.D.
Ichiro D. Okamura, M.D.
Abraham Pollen, M.D.
Karl Riemer, M.D.
Charles L. Schepens, M.D.
Earl S. Seale, M.D.
Albert E. Sloane, M.D.
Garrett L. Sullivan, M.D.
Francis J. West, M.D.

**Deceased*

Residents in Ophthalmology
Elena Barraquer, M.D.
Richard Casey, M.D.
Michael Chang, M.D.
Mariana Dieste, M.D.
Evan Dreyer, M.D.
Sharon Freedman, M.D.
George Fournier, M.D.
Donald Frambach, M.D.
Sharon Gross, M.D.
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